The Emotions, Morality and the Brain

C. v. MONAKOW

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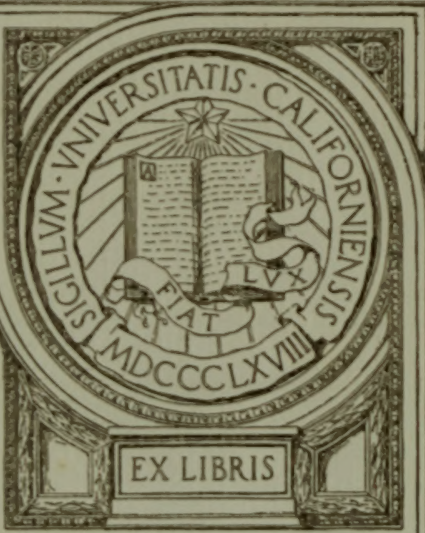

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THE EMOTIONS, MORALITY AND THE BRAIN

BY

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OF ZURICH

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TRANSLATORS' PREFACE

In presenting this translation to the English reading public the translators are all too keenly aware of the fact that the German language construction permits of certain syntheses which in an adequate Englishing would demand a great expansion and rephrasing to be adequate.

We deplore the fact that this translation has been more or less literal. This entails a special intense intellectual effort on the part of the reader to hold the ideas in apposition, which could have been avoided by a gross analytic splitting of the phrasing. As this would have demanded an elaborate rewriting of the entire thesis, the translators have felt that what might possibly have been gained in lucidity would have been lost in giving the essential suggestiveness of the author's thought.

That indefinable tendency of the English language to simplify and almost to emasculate the psychical tension of German thought has been here resisted and we leave the matter in its apparently confused form, although we have wished, for many reasons, that we might have presented this fascinating monograph in a simpler and more easily readable form.

Inasmuch as this work appeals more specifically to those whose intellectual capacity and fundamental training, neurologically speaking, is of the most highly developed form, we have comforted ourselves that this simplification was perhaps unnecessary.

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CHAPTER I

GENERAL CONSIDERATIONS

There is nothing more difficult than to formulate a clear and universally acceptable definition of mental phenomena, particularly of those phenomena subjectively experienced which we call feeling and morality.

The study of feeling, especially of ethical behavior, was, until very recently, the exclusive province of the professional psychologist or the theologian, and was based largely upon theoretical (historical or poetical) considerations, and upon self observation. Feeling and conduct were looked upon as essentially artificial constructions of the inner life as conceived by the psychologist himself.†

Now, however, physiologists and biologists, psychiatrists and neurologists, even jurists and teachers have entered the field and have made intelligent study of mental phenomena including ethical conduct. Consequently, the professional psychologist has had to compete scientifically with the first group at any rate, the biologists and physiologists, inasmuch as these have taken as material for their investigations and experimentation all living creatures, all humanity; together with the various aspects of every day existence, and the gradual growth of feeling and emotion under normal and abnormal conditions. Furthermore, psychology has now become in no inconsiderable degree a truly biophysiological science. It makes use of experimental, clinical and historical as well as of evolutional and morphological methods. In my opinion that man, who will in some future day combine all the findings arrived at by these methods, utilize these investigations and delve most deeply into all these theories, will uncover a rich field of material yielding most fruitful results, provided he himself possesses also a profound practical understanding of human experiences.

In the biophysiological field the most important factor will be, in the first place, a correct starting point of inquiry; secondly, as clear, sharp a definition of the conception as possible; thirdly, a recognition that the experimental physiological method must wait upon the pure subjective analysis, at least from a certain point up. Similarly, the pure psychological method must pause before the biochemical and biophysical processes in the body.

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† In so far as the matter was not a matter related to practical life.

I, myself, have for a considerable period widely studied the works of such schools of psychological literature as Spinoza, Kant Schopenhauer, A. Comte, H. Spencer, Wundt, etc., principally for my own information; reading *The World of Perception and Orientation,* and *The World of Feeling,* in order to grasp the subjects from the point of view of their genesis in the bioembryological aspect. These studies were begun by Schopenhauer and Von Bichat, continued by later biologists (Darwin, Haeckel, Forel, etc.) and particularly advanced in recent years by R. Semon,* with reference to mnemic phenomena, all of whom have chosen this field for very detailed research. My own studies I sought to base upon a still broader foundation, bringing in the added factors of anatomy and physiological pathology, since I included in my cycle of observations brain pathology (Lokalisationslehre) and neurology with its bearing on psychiatry, taking in as well pathological embryology (Idiotie).

In the domain of the emotional life I do not intend to bring forward new facts in my presentation of the subject. I would, however, include some new viewpoints on the principles of the emotional life (a more lively discussion of which has been provoked since the appearance of the writings of Von Breuer and Freud) and try to make somewhat clearer several normal and abnormal phenomena—particularly those which bear upon the problem of morality.

Many may object to the title of my report. The subjects "Morals and Brain" may seem, at least at first glance, to be separated by an unbridgeable chasm. To describe the feelings anatomically sounds like veritable nonsense. Still, diverse as these conceptions appear, there is nevertheless a broad connecting bond between them, *i.e.*, that of morphological-biological and historical development.

To create an instrument of such perfection as the human brain it must have taken thousands of years of endeavor on the part of the "World-will" (which for Schopenhauer is Kant's "thing-in-itself") and infinite effort, to attain the performances ascribed to that organ, the precision and delicacy of the organization on the mental side being nearly equalled by the morphological and structural development.

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* Die Mneme and Die mnemischen Empfindungen. Leipzig. English translations of both are now available. London, 1922, 1924. See Jelliffe, S. E. Richard Semon and his Work. JOUR. NERV. AND MENT. DIS., June, 1923.

What are emotion, morals, and what sensation, perception, and orientation? Everyone is thoroughly familiar with these terms, they are commonly employed. But no one can give a universally acceptable definition of them, setting forth with certainty the real nature of these forces.

Concerning the subjective content of the emotions (in the ego) our knowledge comes almost exclusively from introspection. But we could not begin to analyze and record our emotions were it not that along with them there went the parallel development of language, gesture and facial play. It is these modes of expression that offer us objective standards for measurement and comparison. But speech, like symbolism in general, is a social mode of expression resting upon mutual understanding between individuals. It is a coin for social usage, bearing a definite and recognized exchange value. This " coin " has gained a definite current value through long periods of life in common and of participation in mutual experiences in the same world of feeling and instinct, and through the conditions derived from these experiences (apperception of Steinthal). We gain certain and accurate knowledge of our own feelings, at least of our finer feelings, only when we have refined them and given them precision by contact with our fellow men, in whom we presuppose similar experiences.

This, in the first place, occurs through the medium of the symbolic, namely, articulate speech, gestures and other media; in the primitive stage also through inarticulate sounds. Social feeling can obviously develop only through the direct medium of human intercourse, and primitive modes of expression (inarticulate sounds, facial play, pantomime) are those which have paved the way to articulate speech. Through the medium of the spoken word first, then through the actions and conduct springing from the feelings that underlie the social impulses we have been able to give definite objective body and form to the emotions and make a more accurate study of them.

The vocabulary of daily life, the dictionary, so to speak, of feeling, by the measure and store of its wealth indicates the depth of our understanding and orientation in the sphere of feeling. This orientation is of the very first importance for mutual understanding in social life. Our knowledge of the feelings will reach a higher development only as we make a minute and concentrated study of the more subtle, artistic, religious and philosophical facts in individual cases. With this the spoken word, however, cannot always keep pace. Words do not always express exactly that which is within us, and this causes innumerable misunderstandings and misconceptions among people. These elements in our constantly increasing individual register of feelings, corresponding, that is to say, to our apperceptions, to which we cannot give expression in ordinary words, find outlets through other media which, though rich in content, often have not much significance for the general mass of people since not every one possesses understanding of these media, *i.e.,* music, the plastic arts, religious symbolism, etc. Through this mode of expression, that so powerfully influences our modern life, a narrow circle is drawn around the higher feelings and common interests of a race, even of races. This circle is of enormous significance in evolving and deepening the total sphere of emotion and morals (Gefühlsleben und Gesittung) notwithstanding the great liberty granted to individual interpretation in art.

1. For those who seek for truly scientific knowledge, particularly for biologists, it will not suffice to note what the every-day common experiences of life disclose. Nor for these will even sharpened self-analysis in the realms of feeling of the individual as observed by the professional psychologist, be sufficient. The biologist must probe more deeply into the problems of life.

2. The professional psychologists proceed in their efforts to study the human soul at closer range and by "autoanalytic" means about as follows: They sort and grade the feelings, in the first place following their own inner experiences. But they employ the customary and rather crude vocabulary of every-day life, and depend upon their own language sense for dissecting and classifying the feelings—a procedure which in the last analysis, leaves the whole matter to their own taste and judgment.

3. What we need, however, particularly at this time, is not so much a sharper differentiation of the feelings and the provision of terms and denotations for the more subtly differentiated feelings of the individual (Gefühlsregister), but a careful study, first of all, from the biological standpoint of the primitive feelings and instincts of common experience in their influence upon daily life and conduct. In the next place, we need to study the awakening and coming into existence of the primitive feelings and instincts in the phylogenetic and ontogenetic embryo so far as these find expression through particular acts; then follow them carefully through their further evolution and upward development to the higher forms, straight up to the development of social feelings and morality; as was attempted (to be sure in an elementary and schematic form) by Darwin and his successors (*The Struggle for Existence and the Preservation of the Species*).

We cannot, however, stop at this point. We must extend our studies to include, of course under the constant control of biologically trained self-observation, objective and biological observations of our fellow beings, in the most varied phases of their lives, under normal and abnormal conditions, through confessions, emotional reactions, etc.,—however knotty and at first glance confusing, such a study may occasionally appear.

4. A forceful impetus to unravel the secrets in which the human feelings, particularly the unconscious with their many-sided collisions, their latent accentuations and subaccentuations were veiled, has been given in the past ten years by a small group of neurologists and psychiatrists, who have made studies both upon normal subjects and a number of neurotics (Breuer, Freud, Bleuler, Jung, Adler, etc.), after the professional psychologist had proven himself to be somewhat sterile on this subject. But even before these men, many not unimportant observations in the study of suggestion and hypnotism had been made by Liebault, Forel, Bernheim, Stoll, etc. As a permanent result of these studies it was found that experiences which powerfully affect the inner emotional life, especially those of very early childhood, have a permanent influence upon the subsequent course of the feelings as well as upon the character and conduct of the adult, even when these experiences are removed from spontaneous "ekphorische" reproduction (memory), moreover, in experiences thus colored by emotion, which have passed over into a seemingly harmless latent condition (Komplexe of Bleuler) there may be found an important source of information for later pathological conditions of the mind.

The particularly important and new light shed by these investigations that were conducted with inexhaustible patience and by methods not only complicated, but sometimes even open to objections, brought the following results: (a) That there exists in the emotion laden "engrams" of the individual, even though they be inactive during the period of development, a potential energy, an exceedingly active latent stimulation-index (mnemic source of stimulation), reaching deep down into the pathological, of which condition the individual himself often has no real consciousness. (b) That such a latent stimulation complex (Reizcomplex) may even after many years be brought to an active, functioning condition, united with the former somatic accompanying manifestations and violent mental emotion; when perhaps through detours, through association tests, through appropriate symbols, through seemingly harmless allusions and suggestions, the approach to these obscurities in a single favorable moment may be disclosed (Freud, Bleuler, etc.). (c) And that the life course of the feelings become particularly susceptible to attacks and influences of all kinds only when regarded as slowly and gradually brought into being and form. In particular do those sexual strivings of latent development and seeking early a satisfactory outlet offer, if they are offended, a favorable soil for bringing into being the so-called emotion-laden "complexes." The above mentioned psychoanalytic method, in the broader sense * in the study of neurotics, is undoubtedly important and almost indispensable; although in the hands of the uncritical it may, and even has led into wrong tracks. At all events the testing process ought to be fundamentally improved and a more rigid control instituted. Under any circumstances the results from this method ought to be given value only with the greatest caution.

How shall one, however, in the study of the feelings remain in contact with morphological and even with pathological anatomy, where we have to do with special relations and lifeless matter, whereas the feelings as noted by Kant and Schopenhauer transcend space and in a measure even time? Now we must mark at this point that that world of sensation and perception which is most intimately united with feeling and instinct, and also the actions that manifest the subjective causality of physiological productivity that the analysis of it without the knowledge of the morphological basis can lead to no satisfactory goal.

Many years of association with localization in the central nervous system, particularly in the cerebrum and especially with the clinical manifestations that are the consequences (the course of the reaction as related to temporary functional disturbances), through local attacks upon the brain substance which I have designated as "diaschisis," brought home to me the following thought. Running parallel to the innumerable phases and compartments more or less sharply differentiated with regard to the periodic and rhythmic structure in the morphological development and in the more delicately sensitized fabric of the central nervous system (myelinisation, histotectonic differentiation of the various " systems " histogenesis of the individual elements, etc.) also in the sphere of the evolution of the nervous functions, and lastly of the psyche, there are corresponding experience sequals (Engrammeschübe) which moment by moment articulate, fasten and hold to one another. Further, I assumed that

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* Also the studies by Dubois through unrestrained conversation. P. Dubois. The Psychic Treatment of Nervous Disorders. Translated by Smith Ely Jelliffe and Wm. A. White.

by the side of this successive construction of the function there occurs a corresponding decomposition (produced not only through pathological processes, the action of chemicals, but also by mechanical attacks, interruption of continuity in the network). Clinical empiricism roused me to go further along such thought paths and to apply the methods of observation indicated above to the world of feeling and to the world of morals. For offenses in the realm of feeling may possibly have their material (partly toxic, fermentatively active) components, and a particularly strong component in the case of individuals with a predisposition to neurosis. Through hyperfunction, united with innumerable autotoxic, also histopathological factors, the nerve substance could experience similarly destructive effects, even if these be essentially different in relation to the subtle points of attack of the noxae, as the world of perception and movement has through coarser more sharply localized pathological anatomical processes (Herde), that is to say, in the sense of the degeneration of function; in the former insults, however, less in the sense of a degeneration of " orientation " than of a degeneration of the world of feeling and morals.

I, myself, recognize that I am stepping here upon exceedingly subtle ground, which is trod daily by both the " bidden and unbidden " and upon which one is but too likely to stumble. Nevertheless, I did not feel myself tempted to dodge the difficulties which I, too, should have to encounter. What particularly attracted me in this whole question was first, the importance of a continuous building up and breaking down of functional activity in the domain of the emotional life also; secondly, the dependence of the normal life course of feeling upon the character of the blood and the fluids (osmotic pressure, supply of ferments, etc.) ; thirdly, the study of shock, diaschisis and further chronogenic localization in the central nervous system in the whole animal world. But these matters have been thoroughly discussed in our circle.

(1) The first question which thrusts itself upon us as we step into the field of biological psychology is the following familiar one. Does there exist in animals a susceptibility to stimulation in the nerve texture (and how far down in the scale of animal existence does it extend) which exactly corresponds to what in human life we call " subjective feeling," and at which phase do these gradings of emotion (and in what degree and form) begin to germinate what we call conscious feeling?

The new-born child could serve as the starting point of our study. The new-born undoubtedly gives evidence of both feeling and instinct (pain, uneasiness, need of nourishment). One cannot, however, speak of definite feeling in the children first born. Not until near the middle or end of the first year of life can this be ascertained to exist with any degree of certainty; indeed in the more accurate definition of full consciousness the manifestations come even later than the end of the first year, and still later comes self-consciousness connected as that is with the ability or aptitude to awaken or stimulate definite memories. Full consciousness can, however, be developed only by gradual stages.

Clear manifestations of the will and essential characteristics of conduct are at all events older than the " conscious " concepts. The latter are more probably the products of the former or of attending or concomitant circumstances and can in no way be considered their source or mainspring. In point of fact we find even among adults that it is the more or less finally developed inclinations and instincts that set in motion most acts of life, even complicated ones. And only an entirely definite form of the corresponding mysterious physiological productivity is reflected in us in such a manner that we accept subjectively that light, that sharp penetrating flash, which we designate as consciousness—and even this form is reflected only in circumscribed areas. By far most of that which goes on in our psyche—daily life teaches it to us—and most neurologists know it—reaches the threshold of our consciousness only imperfectly and in shadowlike manner; nevertheless it does not remain entirely inert and is never entirely lost either in the evolution of our conduct or the manifestation of the senses.

The links of each chain of behavior plus the accompanying feelings and instincts are locked in the subconscious or unconscious (unconscious propriozeptive Sensibilität). They unfold themselves further in the brain through latent laws still unknown to us, while we subjectively have the silent conviction that that which we do and do not do is the immediate work of our conscious mind. Upon these subjects Schopenhauer has expressed himself clearly, and in my opinion with unbiased mind, in his work *The World as Will and Idea,* as Spinoza had done before him.

Now to return to the subject of animals. Only in their feelings which resemble our own, taken in connection with stimulants which also engender in us subjective feeling of a clearly defined nature, can we make inferences as to their inner experiences, from analogy. In the finer interpretations of behavior there remains to be sure much that is uncertain. We possess beside good grounds for assuming that animals, dogs for instance, have not only those feelings that manifest themselves in immediate response to extero- or interoceptive stimulation, but out of these feelings there are built up in them "engrammes" of a degree of complication relative to their level of development (latent stages of recently received stimulation); these "engrammes" under modified circumstances in which only one and in fact generally the leading "mnemische" component of the primitive urge or stimulation is received, arrive anew at "Ekphorie" and this in a form which corresponds to an attentuated condition of the former original feeling.

On this point direct corroboration is given by the investigations of Pavloff (conditioned reflexes). In these experiments the secretions of various organs were tested by the employment of fistulae for stomach and saliva and even by the use of stimuli of various kinds. A dog that had been trained to take his food simultaneously with the sounding of certain musical tones following at regular intervals, showed an increased gastric juice and saliva secretion at a sign of awakening desire for food, not only when he had a piece of meat in his jaw or saw it, but also without the presence of meat as soon as the musical tone sounded. (Observed also by O. Kalisher.) In the case of such an animal there suffices for the repetition of this act only a single, not necessarily the most important, element of the stimuli that caused the flow of saliva, in order to bring about again a secretion of the saliva.

This factor is unquestionably of a psychic nature. The so-called mnemonic stimulation operates here, which compel the visceral nerves to act reflexly, just as in the first place they responded extroceptively through the medium of direct stimulation. By means of these experiments with musical tones we obtain objective demonstration of the course of development of many feelings.

These and many other experiments of O. Kalisher justify us, in concluding that in human beings as in animals experiences that are charged with definite emotional-value (Affectwert) are further worked over secretly in the psychic life (grouped according to their value, and subject to the law of causality), thus showing, in other words, that they pass over into a complicated latent state, and furthermore that such stimulation forms are of a very active character and that the "Engrammes" under consideration can be brought to memory by simple symbols.

Individual observations by dog fanciers attest to this fact. In some breeds of dogs (hunting dogs) certain fixed emotional stimuli acquired either through experience or feeling, through sign or symbol which play an important part in hunting (gun-shot, sounds of game in the woods) live and are revived in the animal in latent form through many generations (and persisting latently, are passed on in latent form to the germ and become active motivating forces, R. Semon). Under proper stimulation they can attain to " Ekphorie," even if no training answering to the same stimulus has ever been given to the animal in question. Exner tells us about a hunting dog which from the time of his birth had been kept in a cage and which, when taken therefrom to the hunt for the first time, sprang immediately and nimbly upon the quarry at the sound of the first shot.

All this points to the fact that in the higher mammals the so-called mnemic emotional " Engrammes " can be reproduced through signs and symbols as in human beings, but only within a limited range.

There arises, however, this important question: To what level in the descending evolutionary scale of animal existence do feelings and instincts resembling our own love, greed, passion, anger still continue to exist? Upon which rung in the evolutionary ladder do we encounter the phylogenetic level at which, in some demonstrable form they begin to exist, and to what nerve structure are they related?

If we proceed from the now accepted hypothesis that in its beginning everything is of simple nature, and that in the morphological differentiation of organs, particularly the central nervous system, on the one side, and the wealth of physiological research on the other, there exists an active, causal connection and interdependence, then the following considerations force themselves upon our attention.

The most elementary impulses of life are the primitive instincts, hunger and love. They are the most elemental factors of life and are known as *The Struggle for Self-Preservation* and *The Struggle for the Preservation of the Species.*

As a third moment Darwin names " Natural selection." More recent writers (Loeb) would like to place the instincts at the lowest point in the scale, and put in their place the " chemotaxic " moment in order to exclude every transcendental and anthropomorphic aspect. In my opinion we cannot dispense with either instincts, the instinct of self-preservation and the preservation of the species, if we set out from the biological standpoint. But, of course, it still remains undetermined in which form the inner illumination or enlightenment of feelings and instincts (hunger, for instance) can, in certain animals, be likened to the process in human beings. The reduction of both primitive instincts to one and the substitution of the expression " primitive-instinct " by the expression " Desire " or " Will " (Schopenhauer), does not make our methods of observation more profound in my judgment. On the contrary, I consider it more fruitful if within the world of impulse or inclination we assume the number of single forms to be rather more numerous than is commonly the case, and within these undertake still wider and sharper divisions (into separate principal groups).

In view of earlier observations made by me elsewhere * on the workings of the primitive nervous system or—in the case of individual animals—of the living protoplasm, I incline toward assuming four basic types of instincts that merge into one another, upon which all later active and latent feelings, emotions and their derived qualities are built up and from which they evolve onward and upward to the point of character:

(a) Emotion engendered in connection with the search for food and with the other functions of prime importance in life as well as emotion inaugurating impulses of defense against injury (such as taking up or receiving nourishing and strengthening substances, expulsion of chemical substances dangerous to life, fusion or division, that is, separation of the elements of stimulation).

(b) Sexuality (libido protection and care of posterity—the preservation of the species).

(c) The foundations of emotion connected with creating and protecting collections of creatures of like nature (herds, squads, crowds, etc.). In other words, the basic elements that underlie the social feelings, the " herd-instinct," and finally on the highest level.

(d) The seeds of warm emotions for creatures of other species as well as the germ reverence for all creation (symbiosis, plasticity, accessibility of the animal for training, etc.). The results of training an animal in the direction of a higher level of life, or fitting it to the intents and purposes of such, I should not like to give out in the sense of " self-preservation " without further observation and thought. " Feelings " of this character gradually lead up to the most primitive form of culture (rudiments of culture).

Of course, there are transitions, that is, border areas between these four forms of instincts. It is especially to be noted that the social feelings possibly develop in the minute differentiation of the primitive reciprocal relationship between the " mother animal " and the " daughter animal." In my opinion the basis for the first modes of expression in gestures and for symbolism when these, in final development, reach articulate speech, is found in the primitive relationship between mother-cell and daughter-cell, on mother animal

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* Localization in Cerebrum.

and daughter animal, at a certain stage of evolution. The social feelings and media of understanding represent a perfected continuation and extension of relationship between individuals of similar species that lead a collective life (social, that is, animals living in groups, herds, etc.).

In the ancestral mother, that is, the oldest and most capable individual, the guidance and direction are sought, and these offices are later transmitted to the oldest and most capable individual of the collective group.

The further evolution of the sensual perceptions and instincts follow always with a view to the possibility of an improvement and betterment of the conditions of life (greater strength for overcoming obstacles, adaptation to difficult environments, self-training and practice, etc.); these go hand in hand with the efficiency of the nervous system to adapt itself morphologically to new circumstances.

In my opinion, every healthy creature is born with a germinative impulse, an impelling force towards a definite degree of perfection (ennoblement) which finds its expression anatomically through the tendency of the function to attain localization in the head "Wanderung der Function nach der Kopfende." *

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* See Studies by Child, especially his "Physiological Foundations of Behavior," Chicago, 1924, relative to this important problem. [Translators.]

CHAPTER II

STRUCTURAL AND FUNCTIONAL CONSIDERATIONS

What biophysical performances, that is, capabilities, may and must we attribute to those nervous systems which are still at the most primitive levels of development (numerous nerve cells plus molecular substances, " Fibrillenbänder," fibrillar strands and nerve fibers) nay even to simple living protoplasm (unicellular animals)?

1. *In physiological-chemical* sense: osmosis, periodical intake and elimination of chemical material through the physical cell-membrane.

Life, as we understand it, consists of a continuous autogenous (self-regulating) process of construction and destruction which is continually performed by the molecular cell activity until final dissolution takes place—death, self-preservation and self-destruction. The highly organized molecule (proteins) are supposed to have a position near the cell center (in proximity to the nucleus), and the organic and inorganic disintegration product (ausscheidungs Produkte) near the periphery.* In every molecule of the cell the complicated connections are near the center also (Aimé Pictet). It is not unlikely that even in the processes of assimilation and elimination of chemical substances there is realized a certain trace of pleasurable or painful sensation.

2. *Sensitiveness* to poisons (from within or without), accompanied with the ability to ward off injurious toxic attacks (up to a certain point of resistance, by changes of osmotic pressure, production of ferments, etc.) and to eliminate invading forces.

3. *Irritability:* The nerve cell contains not only those elements with which to sustain its own life, in chemical or morphological balance, but it actually alters itself in keeping with forces within itself. It changes its tension under the influence of stimulus from the outer world: contact and distance stimuli; light, sound, electrical, temperature, stimulation, etc. The cell can under such stimulation (in measure proportionate to its inherent force, be charged, and react in movements (change of locality, muscular contractibility) and this, indeed, in very different ways. Every animal possesses besides the capacity of orientation in space and time, on its own body and also the power of locomotion.

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* " Open and closed chain," through retrograde metabolism, autointoxication of the cell, a possible theory (Aimé Pictet).

4. Every cell manifests *mnemic peculiarities.* Stored up latent irritabilities periodically produced, up to any point of endurance by more immediate actual stimulation (through the ecphoric medium, R. Semon). Early in primitive life the following differentiating gradations in the irritability of the nervous system can be discerned:

(a) The "exteroceptive" stimulation (external stimulation, Sherrington).

(b) Interoceptive stimulation (stimulation from within).

(c) The stimuli flowing immediately out of the nervous action of the organism itself, registering the self-activity of the nerve substance, that is to say, the proprioceptive stimuli constituting the foundation for "engraphia" and "ecphoria."

(d) Where there are several forms of stimuli serving manifold purposes, there arises association and collision of the stimuli with proportionate effects, which may be considered as resultants.

5. In a *biological* relation. For every cell there is an inner germ of emotion, which in the minimum finds expression as primitive will. Here is also to be found the source of self-protection and defense against harmful stimuli. I would ascribe to every cell a minimal primitive quality of reflection of self, equivalent to the feelings of pleasure and pain.

6. Capacity of *growth* or of reproducing creatures of the same sort of development according to a given mnemonic type.

7. To these should be added the capacity possessed by all living beings of adapting themselves within varying limits to new conditions of life and of perfecting themselves in manifold ways resulting in the growth of new and better qualities.

8. *Biological perfection* takes place through increase of the tissue, construction of new organs, and division of labor. The differentiation of the nervous system in the direction of division of labor must be particularly emphasized. This latter process results in the localization of the functions in the central nervous system, in the higher animals.

9. *Perfection of functions* in the ascending levels of the animal world proceeds in manifold directions. At a certain level it leads to gregarious life, that is to say, to life in groups, swarms, etc., the individuals of which are dependent on each other both at the period of their actual existence and educationally for the development of new and higher emotional values (the first germs of morality).

10. Where a *nervous system* is present the nervous elements may be functionally injured in various ways. They may be disturbed in their functioning through too great stimulation or through the interruption of continuity with resulting injuries of the following forms:

(a) the so-called psychic shock (thymoplexy), (b) shock from strong insult at the surface of the body and of the inner organs (cellulopetal), (c) through diaschisis, shock through interruption of the contact of the elements en masse; and finally through general central shock in the form of coma or collapse, this latter being characterized by the circumstance that it may be produced by influences spatially distant.

11. Through cutting off of the *circulation,* through disuse of the organs or nerve combinations, and through compressions, degeneration, reversions to rudimentary states, atrophies, and finally, death may be produced.

The further development in respect to the more extended historical evolutionary structure of emotion becomes determined through the direct and indirect vital life interests on the basis of the laws of memory and of the morphological-anatomical potentialities (structure of the central nervous system), especially on the foundation of the structure of the sense organs and of their centers (communication with the outer world: exteroceptive nervous system).

The activities of the sense organs and the musculature leads to sensation ("reception") and this produces emotion, that is, the "censor," for the resultant of the combined sensation and perception. On the other hand, a definite archetype of emotion, *i.e.,* instinct, adapts the sense organs to the stimulation of the musculature, and sets them functioning (for instance, attitude of the eyes and head towards the source of stimulus), a performance (sight) which represents an estimation of the value of the thing perceived for the economy of life. Between "sensation" and "emotion," consequently, the close inter-relations already existing are further maintained.

The oldest and best known elemental emotion, which indeed makes itself felt in the lowest animals in the form of keen desires, are the needs for air, light and food. This latter may be placed in parallel with pain. Both lapse into comfort or pleasure as soon as they are gratified. Pleasure and pain are bound up securely and directly with the vital, bodily processes and reflect in the soul the condition at any given moment of the struggle for equilibrium, not only of the separate parts of the body but of the organism as a whole. On these primitive emotions, instincts, with which the sexual emotion (driving force towards preservation of the race) is associated on further maturity of the individual, and the whole scale of other emotions, even morality itself, is definitely built up. The differentiation and increase of emotional values ensues under conditions of constant, at times fluctuating, often periodic assistance of the bodily secretions under consideration (secretions of the glands, of the chromaffine cells; "inner" secretions), in the successive needs that increasingly arise during life, in the form of phases passing from one to another (chronogenic construction on the basis of experience).

As is well known, life is a continual series of occurrences, the perception of which is constantly influenced by previous experience. Furthermore, thousands of incidents are repeatedly exhibited with photographic accuracy, and, too, with the same "censor of the emotions." The "exposed film" that is being wound from the beginning of the individual life, builds from separate experiences, in spite of innumerable, uniform rotary motions—within due range—a continuity, to be sure, not wholly uninterrupted, and often changing with reference to the affectivity, and for that reason assuming different values in conformity with the nature of the subjective, very diverse estimation. From this, in the course of time, the personality or character of the individual becomes crystallized.

The new-born experiences emotion only in regard to what is immediately present and for little else (the direct expression of the needs of the body, the so-called "original emotions"). Simultaneously with each "original feeling" are felt in the adult the emotions which have been hard-won through experience, and through this experience, differentiated into the most delicate nuances. These are the emotions which set in activity further evolution and probably also the release of the emotions rising to the surface in the immediate present (illumination of the future). In this way, too, objective causality is set in action, and also its parallel subjective causality (reasons). The causal connection of things thus established under the control of the emotional values (of significance for the economy of life for the individual and for the community) in the form of the relations, in the sense of causes and effect.

A certain elementary subjective reflection of objective causality in the events of life may perhaps fall to the lot of creatures very low in the developmental scale and influence their acts; without, however, in my opinion, entailing either accumulation of new experiences or perfection of function.

The developments which the progressively increasing store of sensations (not the "emotions") in the sense of more accurate realization of the direct product of combined excitation of the sense organs (orientation in space and time) implies as we ascend in the animal kingdom are:

(a) The multiplication of the sense organs, refinement in their structure, their intimate correlation, and, moreover, the enlargement in new modes of movement with adapted arrangement and structure of the extremities and other bodily parts, standing in the close association with them.

(b) Development in temporal relations and content of the various phases of life, extension of the life-curve—its duration. The more complicated the conditions essential to life, the greater and more varied the problems which the creature has to meet, so much the more significant and more delicately organized must the sensations become (above all the "proprioceptivity"), and so much richer must be the form of orientation (gnosis) and of the intellect.

The world of emotion (affect, instinct, virtue, vice, character, etc.) in its phylogenetic and ontogenetic evolution or differentiation keeps pace with the world of sensation; that is, sensations and emotions continue to exercise a reciprocal influence on each other, their organization constantly becoming more delicate. Hand in hand with this refinement of the emotional life—on the higher phylogenetic planes of development—the separate emotional states as they occur undergo not unimportant changes. The feeling of pleasure or pain at a given moment (the original feeling in statu nascendi) is accompanied by memories of similar experiences (ceaselessly being accumulated), which increases the emphasis on the retrospective tension (anticipation) on the one hand, and the looking forward to prospective solution (gratification) on the other. In other words, innate pleasure and pain become emphasized step by step with enrichment of experience (that is, at the higher phylogenetic levels). The same is the case with all possible forms of tension and discharge, inclusive of the prospective tension looking toward the *Future* (anticipation). In this way the most distant future comes to be illumined by these emotions (hope, disappointment). Further, the oldest emotions of all, desire and wishing, receive through experience preserved in the form of ideas an essentially richer significance and purpose and a more constant form, rendered precise through causality, even though they do not undergo any great modification in regard to intensity.

The capacity to infer clues to the future in the immediate present, that is, the restoration of connection between cause and effect, the so-called "causality"—without regard to whether this is accompanied with a vigorous subjective reflection or not (consciousness)—invests the genetic factors in the construction of emotion with peculiar significance. The result is the building up of "feeling thoughts": the sorting out of certain experiences and of thoughts connected with them, according to their emotional values and their importance in the economy of life for the personality, in the present and future, in this last respect also according to their value to morality. A host of emotional values are unthinkable aside from their more precise ideational content; for instance, hope, guilt, etc. Pleasurable feelings of this sort "discount" future values by reference to past values, and imprint thus a suitable seal on the present.

Through the structures of historical and evolutionary significance just now pointed out, or perhaps better called "temporal" structures, as well as through the ideational content increased through experience, the emotions can be refined and brought to greater perfection. They can, however, regress again, and decline in their moral value (deteriorate, degenerate). The more complicated they are in structure the more manifold are their forms of destruction.

A mile-stone in the differentiation and evolution of the emotions towards more delicate shades of emotional values is introduced when gestures were first given as means of communication (expression), *i.e.*, symbols from which, on a higher plane of development, verbal speech evolved. This level precedes the appearance of the so-called social emotions, which demand understanding between the separate individuals of the same species. Through the symbol and above all through articulate speech, the emotional values are stamped more permanently, and these values are connected in joint enterprises, and signify closer relations between separate individuals. Such emotional values of course represent complicated derivations from the basic emotions and instincts. But more of this later.

We may then agree that sensation and emotion are products of the evolution of the living substance; they are twin brothers, who have sprung from the stimulation and irritation of that substance, that is, the nervous elements, and they are indispensable to the vital economy. Sensation is the sequel and result of the stimulation of our senses and organs, whether the stimulation as it occurs, comes to "consciousness" or whether it remains in the fore-conscious or wholly unconscious, and only by chance manifests itself through action. To the world of sensation belong spatial and temporal orientation, then ideas directed to objects of the external world, with their wider derivations, in the form of knowledge and science (abstract thought, mathematics above all). Proprioceptively regulated stimuli (results of a reciprocal action between the already completed components of movements and the components which are on the verge of being manifested), that is, coördination, and reflex sensibility belong likewise to the world of sensation (unconscious reception or sensation).

The foundation of the emotions is a more or less sharply emphasized collision of forces which have been set into activity (primitive emotions, instincts). They represent the immediate momentary interests of the individual and provide the quality tone, the censor for all processes that are becoming manifest in the nervous system, inclusive of those which are concurrently supplied from the emotional sphere. They form the immediate cause (driving force) for our actions. Morality then is founded on the primitive emotions, by making the greatest possible use of the sensations and of experience. The emotions (the primitive instincts of the living protoplasm) are therefore the primary factors; they really create and perfect the nerve substances, construct the brain, and the brain inclusive of the emotional sphere which, by reactive influence, is constantly creating new emotions, becomes the instrument for all our emotions, sensations, and thought. From the very beginning sensations and emotions have differentiated spheres, different anatomical substrata, which, however, in the course of life are overrun by the common secondary morphological products. For the sensations, the sensory cells, or sense organs, and the muscle nerves sensible to both extro- and introceptive stimuli, form the principal starting points. For the emotions, on the other hand, the visceral and sympathetic nervous system, together with the chromaffin cells and blood glands or inner organs serving these systems, constitute the starting point.

The combined result of the activities of the animal and of the sympathetic nervous system, as well as the qualification of the exteroceptive stimuli, as they are represented in the cortex, must be attributed in large part to the world of feeling. A sharper distinction between emotion and sensation on the higher level of cerebral activity, can not be undertaken.

The peculiar work undertaken and carried out by the mnemic factor as well as the activities of the central representatives of the viscera falls in the sphere that we designate in daily life as *instinct* and appetite. The forcible release of these in the immediate present we call *affect* (active emotion). Through the common stimulation of the world of sensation and of the world of affect (experience), as well as through suitable selection and organization of the relative values, the basis is laid for the character and morality of men.*

[* Morality is defined by various authors according to differing conceptions (empirical, rational, supernatural); fundamentally, however, all understand by morality very nearly the same thing. Plato conceives morality as the aspiration to become "god-like." Aristotle conceives it as the striving after Eudamonie. Spinoza: "the ultimate goal" (morality) is intellectual love of God ("amor dei intellectualis"). Here he forms an idea of love as introspective knowledge, as philosophy. Leibnitz defines morality simply as the impulse towards perfection, and Kant in his precise way says: "Act in such a way that the maxim of your conduct can become at the same time the principle of a universal law (categorical imperative)". Schopenhauer defines morality as "denial of the will to live," consequently as something negative (one finds the key to this definition in Schopenhauer's conception of the world as will). Smith perceives in morality, judicious self-love, and Kirschner identifies morality with practical philosophy (similar to Spinoza). Finally, the Christian conception of morality is purity of heart and consecration of the will (see Kirschner).

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* Footnote in original, here translated in text.

From the historical biological standpoint, I might enter here into the following considerations. Morality develops phylogenetically from instinctive cultivation of the life interests that we hold most worthy and sacred, and has, as its final aim, the perfection of humanity with regard to the individual, family, tribe, fatherland, world. Through the cultivation of these last interests, the single interests of the individual become ennobled. In other words: morality is voluntary subordination of the individual life interests to the welfare of the group in the sense that a judicious correspondence is established between individual and group interests (the "rational self-love" of Smith). Morality has in mind essential future values, and is conceivable only on the basis of concern for the future (discrimination of values and broader conclusions arising out of it). The love instinct serves as their origin, and the love of men for one another can be built up only on the surrender of the strictly individual interests (suppression of instincts estimated as inferior). Morality is an egotism consecrated to the world interests of the future (altruism).

The struggle to attain pleasurable sensations and individual advantage forms an elementary and primary factor in every living creature. Pleasurable sensation controls, too, in men a whole scale of separate values, stable and ephemeral, altering from moment to moment, values which strive for preëminence: from the immediate, innate emotions worthy of expression, all the way to the effort towards union with the unknown ("omnipotence of God or the universe"). The personal sacrifices which are produced under these circumstances present themselves principally as renunciation, self-restraint, industry, etc. The individual skill, hard earned through education and discipline, is to render an account to all qualified interests, and so to bring into harmony the world of feeling. The separate grades of emotional life are represented in the phylogenetic and ontogenetic evolution of the nervous system, and dwell within us as relative self-appointed values, but are the oldest original instincts, the most deep-seated and powerful, the most prized acquisitions later.]*

The sharp distinction between sensation and emotion (sensation and sentiment proceeds from Bichat ("Vie organizique et Vie animale") and Schopenhauer ("The World as Will and the World as Idea"), and is crystallized in general by later authors (Herbert Spencer, Helmholtz, Wundt and others), although the definition of these two modes of sensibility is not taken up in corresponding manner. Physiology must still reckon meanwhile, as already indicated, with modes of sensibility which come only through motor, that is, proprioceptive activities, to expression, and which are not "perceived" in the narrow sense of the word. In such activities also is located the world of the reflex, the reflex arc, and coördination (automatism). From these "sensible" activities, the individual "perceives" only that which is necessary for his individual life economy and daily life; that is, the conscious final result of the relative stimulus modifications. And this happens in a manner that is quite distinct, in part, from the physiological structure and from the central localization. In general, one can say that nervous activity equipped with stable components of place and time, as well as with subjective causality, belongs to the world of sensation (the world as descriptive), from which our intellect takes its rise. The activity which is independent of space and time, and characterized by subjective qualitative values and blind craving for action (will) must be considered within the world of emotion (the "World as Will," inner reflection of this). The finer differentiation of the emotions was first taken up by Kant. Morality belongs more to the world of emotion than to the world of sensation. Sensation and perception are correlated more in the domain of physiology, but emotion at least in its truly subjective components is assigned to the domain of psychology, and with these two, neurology is concerned.

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* End of footnote in original.

CHAPTER III

A TENTATIVE ORGANIZATION OF THE EMOTIONS, INSTINCTS AND MORALITY

We shall now consider the more delicate relation between the emotions, instincts, and morality, from the biological aspect. We can divide the emotions of men and animals into two main groups which, like all phenomena in this sphere, frequently overlap: those predominantly physical, and those predominantly psychical.

The former are of ephemeral nature, and usually last as long as the bodily stimulus operates.

A. The "physical" emotions immediately accompanying life.

These are for the most part innate. It is a question here of variation of emotion, appearing daily, perhaps at shorter intervals, being periodic and closely connected with the immediate preservation of life, and which, after satisfaction, lapse immediately into an obscure, mostly quiescent latent state. We include also such as accompany the primitive, innate stimuli of the sensory surface (somatic emotions), if such stimuli threaten our life interests or our organs and bodily parts, or advance them effectively. Emotions collectively represent "tensions" which demand discharge as swiftly as possible. Those emotions, that is, the periodic emotions, are dependent on the condition of the blood at the moment, on the glandular secretions, (with discharge of glands that have acted up to their capacity). These emotions, according to the character and source of the stimulus are of such a nature as in part warn, caution, and guarantee safety, and in part crave satisfaction. Without exception, they allow the following phases to be distinguished.

(a) The preparative phase (phase before the threshold of consciousness).

(b) Phase of manifest (conscious) tension.

(c) Phase of climax.

(d) Phase of adjustment.

(e) Anacoluthic phase and phase of rest. (R. Semon.)

(f) Translation into the latent condition, and in this, the production of the engramme. All of the phases follow one another swiftly, and overlap one another. The somatic emotions allow the same stages to be recognized, only they appear here to conform with the sensory stimuli, and display the same variations with regard to their duration and intensity, as the external stimuli occasioning them. Every emotion is provided with a positive or negative stamp (censor) according to the state of the conflict and of its issue.

1. The visceral emotions are, hunger, thirst, satiety, fatigue, general pleasure and sensual enjoyment; then, nausea, the feeling of choking, the feeling accompanying production of secretions, desire for air, shuddering, etc. (unconscious in the new-born; locally sensitive in a manner neither sharp nor definite).

2. Such corticosomatic emotions we can point out as pain, feelings induced by extreme temperature, desire to cough, heat, tickling, desire to sneeze, local pleasure, need for defecation, blinding, bad odors, irritating noise, fornication, etc. They are all provided with very definite local signs.

B. Psychic emotions (conscious and unconscious: proprioceptive, perceived unconsciously).

Latent emotional activities and those reaching manifestation, affects (transient irresistible flaring up of desire, or will). Some and possibly others of opposing nature combined, or ranked one above the other as it were in conditions of resistance, (with a slight excess of one or the other quality) may enter into action even to the point of passion.

1. Innate, elementary instincts: carnal desire, will wish, impulse, especially in the direction of self-preservation and thriving.

This is the primitive will, which is never known to us in detail, and which exists latently in living protoplasm, that is, in the cellular state. In the immediate present (im statu nascendi) it is provided in men (and also in animals) with the quality of mirroring itself to itself (consciousness of various degrees). It comes into activity in two forms:

(a) In the form of acquisition of food, or of other acquisitions (if successful with positive indications) and

(b) In the form of personal safety and defense, that is, guarding against danger before injurious signs (if unsuccessful occurring with negative indications); it strives constantly towards restoring the equilibrium, something, however, which it attains only for an instant. Then begins the game anew. This constant striving and willing is life.

The rudimentary will as well as the (unconscious) sensibility are present even in the embryonic stage. It is possible that the whole development is a manifestation of the rudimentary will in the form of the mneme (R. Semon). In any case, this will is already present and operative in the lowest organisms.

Through the mneme (formation of engrammes, temporary differentiation of these according to their value for the economy of life, under temporary inhibition or exclusion of what is foreign to the purpose, the development of the ecphoric manner of stimulation, etc.) and particularly under the influx of the world of sensation (in distinction to the emotions) and of motion, the primitive instincts undergo a more or less distinct organization according to purposes which are of special vital importance (in the broader sense of the word). The future life (of the individual) gains greater importance and the past (the earliest experiences of the individual) gains more power in the development of the emotional life (especially of the higher life interests) in the present and future. The whole material of psychic phenomena (sensation, perception, emotion, in their reciprocal influences and successive blendings) that is, the life interests can be arranged naturally, with special consideration for the objects to which they are devoted, in the following categories:

(a) The true self-preservation of the single individual (true only for infancy).

(b) Maintenance of the species, or sexuality (libido, sex).

(c) Maintenance of the tribe or the more limited group (love of home).

(d) Relations of the individual to all humanity, and to the world in general (infinity, eternity, fate, God, etc.).

In each of these categories, which, in the child, evolve in a very definite order of succession (first the phase of self-preservation, etc.) are to be distinguished in the adult:

1. Innate emotions in the stage of the immediate present; im statu nascendi, (original tensions of a primitive sort, which presume no previous experience).

2. Emotions arising in the immediate present, along with which, however, experience also plays a rôle, and wherein the future is already taken into consideration.

3. Complicated emotions in latent state, in labile equilibrium (with excess of emotion now of a positive, now of a negative character).

4. Permanent latent states. Ethical derivations and values, objectivity in the sense of a like attitude to like phenomena in our fellow men. Virtue and vice.

Parallel with these phases founded on abundant experience, there is also a perfection of the more delicate morphological conditions in the cortex.

I. SELF-PRESERVATION

Feelings of different grades with a positive stamp (growth).	Feelings of grades clearly distinguishable with a negative sign (insult, warning).
1. Cheerfulness, pleasure, interest, wish for safety urge to activity wishes.	ad. 1. Fatigue, apathy, anxiety, pain, anguish, suffering, despair, indignation, repugnance, refusal, impulse to flight, etc.
2. Surprise, hope, belief, expectation, anticipation, cupidity, more precise wishes, pluck, curiosity, (and also transformation of a failure into a success, longing for repetition of a success). The future is anticipated in a pleasureable sense.	ad. 2. Fear of sudden attack and of being caught unaware, impulse to escape evil. Hopelessness, impatience, disillusion, need of protection. The future is reflected darkly.
3. Delight in power, audacity, diligence, the drive toward acquisition and the drive towards possession, towards keeping what is acquired. Securely and safely begetting in life.	ad. 3. Sorrow, care, discouragement, negligence, anguish, despondency, doubt.
4. The fully developed individual character; joy in combat, perseverance, strength of will, courage, self-restraint.	ad. 4. Timidity, irresolution, cunning, depression, etc.

II. FEELINGS RELATED TO PRESERVATION OF THE RACE (SEXUALITY)

a) Emotions in the stadium of expression: love, desire, passionate impulse towards union (libido), ecstasy, orgasm, masochism, shame, eroticism.	a) Aversion towards sexual interests, frigidity, repulsion, sexual satiety, sexual hatred, anger, disgust, indifference.
b) Emotions of the immediate present with regard for the past and the future (up to the most intense passion): vows of love, dreams of happiness, longing, impulse to court, desire for domestic happiness and for maternal love, love of children, etc.	b) Sexual disinclination, contempt for faithless partner, jealousy, disgust towards intercourse, fear in anticipation, psychic impotence.
c) Unstable latent state, amorousness, continuing married love, satisfaction with married life, joy in maternal duties awaiting one, etc.	c) Remorse, grief for the loss of a loved one, sexual jealousy, fear of faithlessness, happiness betrayed, hatred, lack of sexual satisfaction, unfulfilled hope of pregnancy.
d) Character: sexual honor and faith. Care for posterity, accomplishment of matrimonial and educative duties, sensuousness, ideal disposition.	d) Faithlessness and lack of honor, inconstancy, sexual shame, hatred towards offspring and towards parents, fear of pregnancy (before the child), maternal negligence, etc.

III. INSTINCTS AND EMOTIONS IN THE STRUGGLE FOR THE PRESERVATION OF THE GROUP, AND FOR THE VICTORY OF THE INDIVIDUAL IN THE GROUP.

a) Innate emotions or early acquired emotions, reaching expression in the immediate present.
(Periods of existence: latent state, tension, climax, decline, transition into the latent condition. Latent after effects.)

(With a positive stamp)	(With a negative stamp)
Love and interests (patriotism, charity), emotion towards the group ("herd instinct"), feeling of group unity and good fellowship and impulse towards the stimulation of these allied social pleasures, love of combat, courage, enthusiasm for common interest, reverence for the higher things, collective and individual love of power, gratitude, public rejoicing. Reaction: alliance, conflict, assault.	a) Shut-in character, anxiety for the mass, fear of a surprise attack, exhaustion in conflict, intimidation by another, antipathy, personal opposition, hostile emotion, aversion, refusal, rage, fear, anger, indignation, fright, fury, love of pursuit. Reaction: self-defense, flight, self-concealment, disguise, or the feigning of death.

b) Emotions becoming manifest step by step through capitalization of the past, consideration of the future.

1. Longing for friends and companions, universal defense and attack, peace, victory, pride, desire for praise. Reaction: collective and individual attack, work and other undertakings, protective measures, etc.	1. Mortification, humiliation, regret, disappointment. Boasting, sense of blame or guilt. Regret, remorse, menace and threat, censure, warning, ill will, hatred.

c) Unstable latent condition with a tendency to successive high tides of emotional currents (even to passion itself), of a positive or negative nature in relation to individual persons.

Affectivity (love, comradeship), emotional attitude, mood (tranquility, happiness, contentment), the feeling of deliverance, reconciliation, gratitude, admiration, self-respect and conceit, expansion, peace of mind, atonement, praise, ambition.	Sense of guilt, depression emotion, evoked by punishment, regret, feeling of repentance, pangs of conscience, anxiety. Loneliness, seclusion, sense of injury, sense of persecution, fraud, insult, disgrace, violation of honor. Hatred, resentment, bitterness, futility.

d) Character and morality (provided with a symbol). Permanent derivations from experience. Creation of ethical values ("ethical engrammes"). Secondary latent conditions of the emotional life (counter-currents included), etc., from which it is conceived continually in the present. Virtue and Vice.

(With a positive stamp)	(With a negative stamp)
Goodness, generosity, sense of honor and reputation, friendship, fraternity, partnership, uprightness, ambition, sense of duty, loyalty, modesty, obedience, responsibility, honesty, perseveration, application to work, enterprise and disposition for business, good will, benevolence, love of braver, freedom, fair play, compassion, pity, brotherly love, reverence, respect, love of truth, public service, right and justice.	Hostility, indifference, vanity, arrogance, faithlessness, sham, pretense, cunning, fraud, violation of justice, envy, ingratitude, cowardice, cruelty, servility, feeling of inferiority, evil, spite, malice, baseness, infamy, avarice, vileness, ill-will, greed, selfishness, vindictiveness, pleasure in inflicting pain, moral apathy, impulse to destroy, peevish disposition, loss of conscience.

IV. PRESERVATION OF MANKIND (HUMANITY) AND CULTIVATION OF RELATIONS TO THE WORLD AND TO GOD (ACQUIRED EMOTIONS)

a) Humanistic and religious emotions coming into Expression (reaching ekphonie).

Inner religious composure, adoration of the Highest, bliss, fervor, rapture, glorification, gratitude towards the Highest, God and Nature worship, inner illumination, religious ecstasy.	Indifference, swearing, emotional conviction of being damned, psychic pain, self-reproach, up to overwhelming contrition, dread, anticipatory fear, foreboding of misfortune, anxiety for the dead and the destruction of the world, etc. Despair, horror, obstinacy. Feeling of loneliness and of being forsaken, indignation, depression, pessimism, compulsion to suicide, pangs of death.

b) Expression of these emotions in relation to the future.

Belief, confidence, hope, impulse towards giving up difficult tasks and resolutions, reward, longing for deliverance, duties towards our contemporaries.	Hopelessness, doubt, fear of punishment, presentiment of coming disaster.

c) Unstable latent condition with a tendency to affective currents.

Psychic peace, joys of love, harmony, salvation, clear conscience, innocence, emotion toward forgiveness of sins.	Gnawing conscience, dejection, psychic pain, melancholy, doubt, ungodliness, grief, discontent, life-weariness.

d) Character, ethical conceptions (Virtue and Vice).

Altruism, innocence, charitableness of heart, striving towards the good and true, impulse towards ethical perfection and purity, impetus towards artistic expression (painting, music, poetry), desire for knowledge, the urgent need of explanation (science, religion, etc.).	Moral apathy, religious indifference, negativism, silence, perversion, impulse towards destruction and search to kill, vengeance even to annihilation of hostile symbols and artistic productions, religious antagonisms, degeneration.

CHAPTER IV

THE ANATOMICAL STRUCTURES AND PHYSIOLOGICAL FUNCTIONS

A clear presentation of the "anatomico-physiological components" of the emotions belongs certainly, as I have already pointed out, to the most knotty problem of all physiological psychology. One asks himself involuntarily: how can a morphological point of view be brought to bear on phenomena which seem to belong exclusively to the "I," that is, to the essentially personal experience, and which issue from our very heart, and are conceived as for ourselves alone. However—as daily experience teaches—every psychic process, as one analyzes the nature of the soul, presents certainly a physiological effect in the brain, whether we will or not. It is inconceivable except as going parallel with the most subtile organization of the nervous system; and as process in the living nervous substance, it must have a material, or, more accurately, a physiologico-biological component. The brain has already been designated by the early investigators, the "material substance of the soul." The physiological-biological component of the soul, especially of the emotions, might indeed be discussed objectively in my opinion to as good advantage as every other physiological process. The chief difficulty in this discussion lies in the need to define that component more accurately, and to outline the limits of the personal "I." Of course, only this factor in the emotions should be discussed fully here, and the subjective "Ego," with its essentially personal experience, should be considered only in so far as it is necessary to comprehension, as a supplement and control of the physiologico-anatomical component. All the points coming into consideration here naturally can be reviewed to-day only on the purely hypothetical platform, and my exposition to-day has the character only of an attempt to sift critically something of rich anatomico-physiological and biological significances, which was known to us earlier, and to bring it into some sort of relationship, albeit incomplete.

The physiology of the senses and sensation (in contrast to the emotions) has become the object of relatively exact scientific inquiry, in so far as it is a question of a direct objective observation, research extending to that phase which we designate as sensory perception or observation, and the principles involved are universally recognized.

Anatomically it is a question here essentially of the most exact possible determination of the paths of innervation, which branch out from the sense organs or surface of the body, in centripetal direction to the primary "centers," and then pass beyond these, through the mid and inter brain to the cortex. This course is mapped out, as you know, according to definite laws and a definite architectonic arrangement. These are in part the routes, the blocking of which, we know from experience, injures or suspends the reflexes released by impressions on the senses or the sensory surfaces. These pathways and centers, even the primary centers (metameric system) are known to-day with a fair amount of accuracy (though for the most part only in rough outline). But, at least in part, some of the finer physiological significance (functions) is not well understood (especially the sectors of projection fibers, which spread out in definite cortical areas). Certain it is that the cerebrospinal paths belonging here, before they become the definite anatomical basis for sensations (sensory stimulations which have been elaborated and "written in," that is, in the form of engrammes, "ideas," etc.) must traverse special groups of nerve cells, fibrillary bands, and molecular substance in manifold directions and must be made use of periodically (rhythmically) in different ways. The same elements, but in other combinations, are ceaselessly being put to different uses. But notwithstanding this it is possible to ascribe certain chronogenic localizations to the physiological performances, and indeed to determine this localization in the cortex, but in a form and combination which has little to do with abstract ideas in their psychological construction. These are localizations in the cortex with which we are familiar, that is to say, the spheres of vision, hearing, and the zones for the extremities, etc.

How does it stand now with the emotions and even with morality in regard to their more definite morphological representation? How can the somatic components of the various values provided with a complicated and rich emotional scale, and with the wider derivations from these be comprehended from a physiological and morphological point of view? For a little space here I will discuss the elementary emotions or organ-emotions (pain, sensual pleasure, hunger, thirst, etc.), as they disclose themselves in the immediate present; these are, with men and animals, admittedly dependent upon the stimulation of definite cerebrospinal, that is, visceral and sympathetic nerves, but for our emotions they continually proceed out from definite and relatively clean cut localizations in bodily segments (the emotion of hunger we localize in the stomach, etc.), that is, the relative stimuli flow towards the central organs through the mediation of wholly distinct nerves (vagus, glossopharyngeal, spinal ganglion system, metameric system, etc.).

It is a question therefore of " interoceptive " or " exteroceptive " impressions (pain, for instance) which are supplied to the central nervous system, or the cortex, through routes similar to those serving sensory perceptions, orientation in space, and later gnosis; or perhaps through the same route.

But how is one to regard the primitive instincts, the will, the emotions, feeling of security, etc., from .the " physiologico-anatomical " point of view? Do they possess in general a more closely definable, somatic component accessible to a central localization, and how might it possibly be conditioned? To take this greatest of biological enigmas in hand, straightway excites a shudder when we consider the very modest physiologico-biological knowledge we possess to-day. Because the instincts make use of the visceral as well as the cerebrospinal nervous systems in a physiological, always well definable manner, the instincts accordingly build a physiological, and what is more, a most essential physiological source of stimulation for most manifestations of life. This source must spring from the anatomically well-defined points in the central nervous system, since there are a number of well known chemical substances (endogenous and exogenous poisons) which exercise an enormous influence on our instincts, impulses and other primary emotions as well as on the visceral innervation, well known to us anatomically (organs of digestion, circulation, and sexual functions). Hence here at least our desire for an exact physiologico-biological orientation is realized. These are very often phenomena whose manner of working must be regarded as physio-chemical, and as proceeding from definite nervous elements (specific sensitivity, Langley, and others). Also last and not least the fact must be emphasized that we are acquainted with pathological, indeed even prevailingly mechanical moments (trauma, foreign bodies) which, acting diffusely or on very definite cerebral structures, affect the emotional life in a very definite direction, exciting or paralyzing it.

The question arises: Is the emotional life, equally with the world of sensation, bound only to the central nervous system, and here, specifically, only to the cortex? Concerning the so-called latent higher psychic emotions (derivations of somatic emotions, and possessing engrammes provided with " ideas "; virtues, vices, and so forth), varieties of emotion which presuppose personal experience of value in a definite way, and which for the most part are " grafted on" the primary instincts, as it were, this question is to be answered in the affirmative.

Concerning the elementary emotions, for example, hunger, sensual desire, pain, I cannot answer that question in the affirmative offhand, and further evidence is necessary before I can localize these phenomena in the cortex. Moreover, if we take pain for an example, the answer depends exclusively on how one will define pain. If only such phenomena following excessive stimulation of the bodily surface or inner parts are called pain, as become known to us subjectively as insults and as immediately fall under the subjective category of causality (origin, result), then the painful emotion must be referred to the cortex which is the only mental organ of reproduction which is adapted to receptivity. If we adopt a broader conception of pain, again, for example, in the sense of a chain of defense reactions (to protect the body from pain) more or less graduated according to the intensity of outer stimuli, and if we seek pain everywhere in the organism, where a physically represented "defense of the interests of the injured organ or bodily part" following directly on excessive stimulation, is released, this defense being in a form adapted to the strength and nature of the stimulus; then we can speak of pain as represented even in the separated spinal marrow, indeed, of pain represented in the spinal ganglia. But this is not the current usage, and could lead to confusion. Pain, in the biological sense, that is, in the sense just indicated, must be ascribed in strictness to every living cell, also, too, separately to every cell residing in the human organism ("individual cellular pain"). But then it would be necessary to distinguish various forms or grades of pain (individual, collectively organized, visceral, cerebrospinal or cortical, that is, conscious and unconscious, manifest, latent pain, etc.)!

One sees that the psychic idea of pain (thought of as a unity) and the pain built up biologically from those components and grades do not coincide. For the form of stimulation that one designates as bodily pain in the clinical sense and in that of daily life (pain recently revived) or conscious feelings of pain (complex formation), may not be regarded as having a sharply limited localization of island-like formation, even if that pain is provided with a more or less acknowledged localization according to our experience; that is, is felt in very definite regions of the body. Certain it is that every group of pathways can be injured without the feeling of pain being necessarily produced as a roughly outlined localization in a member or organ in any place whatever. At any rate destruction of the whole Rolandic region and surrounding region to some distance, does not necessarily cause permanent contralateral hemianesthesia (in addition, destruction of the optic thalamus would be necessary). Indeed, according to my clinical experience, and according to Goltz's and my experimental findings, a dog (or man) deprived of even a whole hemisphere can still possess a lively feeling of pain in that half of the body opposite to the brain injury, though he possess only imperfect topognosia. According to Goltz, a dog deprived of both hemispheres, if he is ill-treated, gives signs or reactions that can be interpreted only in the sense of a painful feeling, imperfectly preserved, of course (pain in the biological sense). The feeling of hunger as well (somatic component) according to this investigator, is not wholly obliterated in the dog deprived of its hemispheres (restlessness, salivary secretion at the time of the accustomed meal).

Concerning peripheral transmission and the subcortical centers for stimuli provoking pain, we are not yet satisfactorily oriented; only this much is certain, that they are mediated peripherally through cerebrospinal sensory nerves, and that, in the central organ (spinal cord, of course, in a systematized diffuse structure), they spread through the gray substance of the spinal cord as well as of the oblongata (Schiff, Rothmann) mostly in diffuse manner, but not exclusively so. In the oblongata one must seek the connections for the excitation of pain prevailing in the lateral part of the formatio reticularis (at any rate outside of the lemniscus region). From here on, the relative conduction paths might utilize the fibrillary lattices and arcuàte fibers as the preferred route. They conduct to the contralateral hemisphere and, utilizing in part the fibers from fillet to internal capsule and thence to the superior parietal lobule (especially the fibrillar bands) proceed in a scattered manner to the ventral nuclei of the optic thalamus where it is possible they split up. A direct connection of sensory spinal cord fibers with the cortex through the internal capsule does not exist. The connection with the cortex takes place as I have pointed out earlier (1881), through the mediation of the thalamus nuclei, and probably in such a way that single series of cells must be traversed (whereby a modification in the stimulus might take place), before the result of the stimulus is communicated in a suitable manner to the cortex. Certainly central pains can be engendered by small irritating foci in the thalamus opticus itself or in the immediate neighborhood and communicated to the separate extremities (Edinger, Greiff, v. Monakow, etc.). Such stimuli pass towards the cortex through the mediation of the internal capsule, and are felt as referred pain in the corresponding limbs (especially in the arm).

Moreover, in my opinion, every part of the cortex, by a flood of suitable stimuli of various kinds, can produce peripherally felt pains or sensations, most usually proceeding from the small celled upper layers but sometimes from the lower, in the contralateral arm, leg and half of the face (localized) to be sure only if the posterior central convolution is stimulated.

Do all regions participate, and in these do the cell elements in the cortex (nerve cells and molecular substance) participate equally in the production of bodily pains and of visceral emotions (hunger, thirst, sensual pleasure, etc.), there being for this last also definite conduction paths through the inner capsule? This question was slightly touched on earlier. It must now be discussed in relation to the problem of the more delicate phylogenetic division of labor appearing constantly in the nervous system.

We must here enter into the biological assumptions that in the lower animals (for example, worms), that which is produced in the way of primary emotions in the less differentiated nerve cells here (and indeed also in the organ cells closely united with these), in higher phylogenetic development is distributed in the newly won structures, in the same manner as are the increased performances in the regions, sensation and motion in general (as complicated forms of motion and sensation). We might also assume as well, that the progressive differentiations of the senses, sensation, motor cells and "centers" produced also an adequate differentiation in the sphere of emotional representation. Even if every nerve cell in the newly established parts of the brain, entrusted during a definite developmental phase with a more or less specific performance, reaches a certain measure of individual emotional representation—yet the majority of differentiated emotions will be continually the result of the collective activity of the apparatus entrusted simultaneously with the construction of the higher psychic performances. This apparatus in the course of phylogenetic changes becomes localized in the frontal end (the cortex in mammals), and there remains now for decision only the important question whether or no, in what degree, and in what way, the morphological representatives of the emotions in the midbrain, metameric system, and ganglion system, have limited their erstwhile sensory performances and turned them over to the cortex.

This question, of course, can be answered only in a very general way. The import of the morphological and incontestable phylogenetic migration of function towards the frontal end and the division of labor inaugurated thereby in the central nervous system (upwards through the animal scale) lies in enriching the sphere of new forms of excitation, in an improved organization of performances through economy in space and effort, and in transplanting the complicated forms of the "collective mneme" (imprint of the engramme, ekphorie) into the sphere of the great cortical surfaces with its millions of nerve cells, histologically differentiated with no greater delicacy. Only in such surfaces in the anterior end (roof of the midbrain in lower vertebrates) is sufficient space present for a development *en masse* of the newer forms of excitation (experience).

In all cases where new nerve centers, more richly equipped tektonically, grow out of primitive, ancient foundations, and where morphologically young forms of apparatus are differentiated out of the primitive cell connections in the direction of the anterior end, we see the following morphologico-histological modifications appear—in my opinion essential and exceedingly important—in which doubtless the histological representatives of the emotions have their share.

The number, magnitude, and morphological differentiation, especially of the important somatochromic elements (nerve cells) in the primitive anatomical centers (for instance, "motor" nuclei) steadily decrease absolutely and relatively, upwards through the animal scale. The vanishing material is employed for the upbuilding of new, differently conditioned basic material. The appearance of new nerve substance takes place, according to my conviction, by proliferation of young cellular forms, which histologically are less richly differentiated than their progenitors; what they lack in the latter connection they make up by their great number and close grouping, as well as through richer fibrillary structure and branchings (rich molecular substance. There are, moreover, cells which already appear in part in the very first organization of a nervous system (already in worms) but only in scanty number. I have in mind in this connection (for example, in the red nucleus) the transitional forms between small star-like and mitral formed cells and the granular cells present sometimes in the lower vertebrates, cells which attach themselves as "satellites" in moderate number to the principal elements. One acquires everywhere the impression that phylogenetic development of the small elements increases at the expense of the large nerve cells, namely, the largest and especially richly differentiated; but also, moreover, that the large elements in single instances accompany the young, small cell groups on their progress towards the frontal end or cortex. In the wider series of changes, many an old tektonic organization is changed in the phylogenetically young foundation to a new tectonic grouping, which above all in the cortex are placed far apart but connected through association and projection fiber paths (distribution of definite structures to many parts of the brain).

The various new parts of the brain, which arise in this way, acquire indeed very definite morphological boundaries; their functional independence is much curtailed by the circumstance that every conduction section assumes only very definite components of a function, and that the old parent centers, now become rudimentary, retain still only a certain persistent " scaffolding " of their original activities. In other words, the new structures are formed by various mutual displacements, and new groupings or adaptations to new spatial relationships, in keeping with the functional duties assigned them (for many of which we have not yet formulated the correct question upon which to pursue our quest on the physical side). Freeing themselves from the parent alliance, they take the new position referred to them with their attitude in keeping with that part of the brain situated at the most frontal ends, this being in higher mammals the cerebral cortex. At this stage of development we come to cortex representation of the various bodily sections. To reiterate: The various old and new " colonies " keep more or less in touch with one another, and many a persistent part of the old phylogenetic structure is fairly unchanged in the new colonies. The last, *i.e.,* the cortical substructure, has, however, the purpose of joining those functional parts in the activities of which the principal rôle is played by mnemic fixation and rich combinations of successively acquired forms of stimulation; that is, where there is less stress on the specific function of the single elements than on the collective operations in various directions, and an exact, temporally arranged organization of performances. Only thus is constructed social nervous government with numerous psychic interests, which are held in bounds through differences in the importance of the various demands.

The question now forces itself upon us anew: How are the morphological representatives of the emotions affected in this division of labor in the nervous system, a division that is on a great scale although restricted within definite limits and determined in its course by the old phylogenetic tectonic organization? What part in the production and building up of the " somatic " and " psychic " emotions do the various sorts of cells and fibers in and outside of the central nervous system take? Here, just as with pain, we must first distinguish the individual " emotion " in single cell (" cell instinct " in the biological sense) from the various forms of collective organization of the conscious emotions (collective, total emotion of the creature), and then distinguish the emotions which lie below the threshold of consciousness, the unconscious emotions and such as exist in the latent and preparatory state. According to my opinion, as already indicated, an extreme minimum of wish-impulse as well as feelings of pleasure and pain in the biological sense are represented in every germ cell, indeed in every living cell even of the mature individual, and come into expression perhaps through momentary biochemical composition of the living protoplasm. Moreover, the vigor and magnitude of this biological "individual cellular emotion" which of course is as far removed from conscious human emotions in the sense of common parlance, as heaven from earth, may not differ overmuch in the various organ cells of the body, of course with the exception of the nerve cells (*cf.* also "World as Will and Idea," by Schopenhauer).

Through the coöperation of the various cellular elements in the cellular body conditions, and through the division of labor which has sprung out of cellular conflict, that is, through breeding and cultivation of specialized factors, even for the representation of the emotions, differences sprang up between all elements (in and outside of the nervous system) sharing in the erection of various forms of emotion, which, through their position in the total development of the human individual, differ enormously according to their content in origin and life economy value.

Before all in this respect, we must hold to the fact that numerous delicate emotional distinctions presuppose a rich individual experience and the having lived through many emotionally toned events, and that the biological causality plays a powerful rôle even in the world of emotion.

If we anticipate at this opportunity the pathology of the emotions, that is, draw into the discussion the injuries incurred in the emotional world through poisons or pathological processes in the brain, then we are led to the following morphologico-physiological conclusions which few at the present time deny. As is well known, the structures which serve as an anatomical basis for the elementary sensations (in contrast to emotion) and motions are confined certainly only to the central nervous system, and in the spinal and subcortical regions, and upwards to the cortex are arranged on a strictly tectonic plan. They are distributed according to members or parts of members, or according to synergies or synkinesias or according to reflex components released from definite sense organs. They are organized in the form of local (anatomical), relatively sharply defined stations and directions, even to those parts where complicated stimuli combinations and derivations from them begin, and where, for the successful result of the stimulus, the temporally, that is, historically differentiated structure is the one of importance and the specific function of the single cells reaches zero. In contrast, the stations of innervation for the emotions arising consciously in the immediate present, or resting in the latent state, and indeed the stations of innervation for the primary emotions (pain, hunger, etc.) are already relatively diffusely represented in the spinal and mesencephalic nervous system (although represented optimally in the known cerebrospinal conduction paths and "centers").

The conduction paths and stations for pain on the surface of the body, and those for the various visceral emotions, are indeed referred from the periphery of the body, or from the inner organs and ganglia, to the spinal cord, and in so doing, make use of distinct anatomical conduction paths. At the same time, if for instance the "preferable" paths in the spinal cord are blocked, they can still be guided to the cortex—so long as the primary centers or nuclei are not destroyed on both sides (for instance in the mid-brain or thalamus—and also at such times it is a matter of indifference what supra-nuclear and locally limited conduction paths are interrupted. Moreover, when there are cortical defects, pain and pleasure, feeling of tension and release, together with earlier earned emotional possessions (complete emotional values) can be awakened and stimulated from the periphery and inner organs, so long as convolutions provided with sound cortical substances are present. At any rate, all experimental interference, which has as its aim proof of an "island-like" localization of the emotions, as Gall and the phrenologists once had a naïve notion of them, are totally demolished; even brain pathology (theory of localization) has furnished at no time facts of value supporting the view that there are definitely circumscribed "emotional centers." However, against efforts to exclude all and every localization of the emotions in the cortex, the fact must be kept in mind that defects and diseases of a definite convolutional section in the cortex, injure certain emotional forms more severely than other forms (effects of diaschisis). In this connection I recall the observation by Goltz on appreciable character changes (definitely heightened reflex irritability) in dogs whose frontal brain had been excised (Munk found, to be sure, no corresponding disorders in the Macacus), and observed especially in tumors of the frontal brain (even on one side) the so-called "Witzelsucht," and changeful moods in the patient, etc. These symptoms certainly possess a definite although slight diagnostic value. Such phenomena can arise, it is true, in connection with foci otherwise localized in great brain centers. Assuredly it is a question here of no law, and these facts do not prepare us to ascertain whether with tumors still other, only indirect moments, standing in relation to the localization, do not play an important rôle. I have now in mind the chemistry of the blood and disordered glandular secretion.

Herewith I proceed from localization in the cerebrum, which at least has only a minimal significance in relation to the higher emotions, according to my present view, to another consideration, which bears upon the development, that is, the activities or richness of the emotional world, and to which a rôle at least as important as innervation in the narrower sense (conduction, storing up) is to be assigned. This point is related to inner secretion and the composition of the blood, as just pointed out. I need not here detail how the whole sexual life, the search for nutriment, that is, the desire for taking in food, then the love of adventure and battle, the emotion realized through possessing strength and advantage, etc., is inconceivable without participation of the glands of the genital apparatus, the great abdominal glands, the adrenals, the thyroid, the hypothysis, the epiphysis, and without the blood elements so closely connected with these glands, a fact which is to-day generally admitted. Less familiar at the same time, is the morphological, that is, the historical and evolutionary side of the whole question, especially regarding the somatic side of the emotions.

We now proceed from the proposition that for the "world of sensation (in contrast to emotion) and motion," that is, for spatial and temporal orientation, the chemical constitution of the blood is of relatively trifling significance (blood containing oxygen only being necessary). This assumption also wins valuable support from morphological considerations. Soon after the first differentiation of the ectodermal cells, for instance, already in the phylogenetic grade of the "turbellarian," we see a tolerably well marked organization of the nerve cells into an exteroceptive, sensory and motor organs) and into an interoceptive structure. The first occupy, upon the whole, more the outer, the latter more the inner parts of the body. Already at this stage one can identify here and there, especially in the region of the last mentioned part, vesicle-like cells without nerve characteristics. These cells by their armature and their light yellowish pigment suggest certain elements in the adrenals of mammals. According to Kohn similar cells are found in the so-called chromaffin system and stand in the closest relation to the sympathetic. These cells are brought in close union with the adrenals, and are considered as homologous elements of this as well as of the chromaffine system. In the human fetus, one finds already at two months an advanced foundation for the adrenal, and this is separated only very slightly from the gangliar rudiments of the abnormal organs. Perhaps in the body wall of the turbellarian worms still other cells are present, which represent preliminary structures of the other blood glands (thyroid, hypophysis).

In considering the structural connections in the body of that animal, the idea now arises that—from those Leydig cells—certain chemical materials (adrenalin and related bodies) are conveyed to the nerve cells in the inner wall of the gut, to the small sensitive elements, as well as from the "granules" ("satellite cells") collected here, which are, on the whole, scanty in number. These chemical materials are of the greatest significance for the whole nervous economy of the animal. At any rate it seems highly probable that a coöperation of certain secretions of the blood glands derived from chemical combinations is still necessary to a stimulation of the sensitive cells constituting the real foundation for the visceral emotions, besides the stimuli proceeding from the inner wall (interoceptive). Furthermore, the so-called visceral emotions at least represent the product of the mutual, that is, reciprocal influence of the two cellular systems referred to above; *i.e.,* of the nervous cellular system and that of the blood glands. In my opinion, a chemical participation proceeding from the glandular apparatus would be necessary, consequently, to the "birth" of the "visceral emotions"; also it is very probable that the corresponding chemical combinations are indispensable to the production, that is, the excitation, of certain fundamental somatic emotions in the human cortex.

Of course a powerful component of the emotions (and of the elemental "will") both individual and collective, will reside in the primitive sensory cells, and their dependents in the ventral passage wall of the animal, and already here represent a certain unity of the somatic emotional life, in particular, pleasure, dissatisfaction, tension, release, want of food, sexual impulse, and so forth (in manifest and in latent forms). For continued action, that is, for the flow of life, the components certainly still need the coöperation of definite still unknown elements which supply specific chemical ingredients. These elements (already at a very low phylogenetic stage) have been differentiated from the general living protoplasm of the unicellular animals.

On higher phylogenetic levels the two systems, namely, the somatic and the visceral nervous system (even upwards to the optic thalamus, or the floor of the third ventricle) lead a fairly separate existence, the relative pathways running separately for the most part (only in the cortex does a close union take place). The blood glands, becoming differentiated by degrees from the Leydig cells, and filling the biochemical rôle in the function of the visceral nervous system, are connected only with the sympathetic and the autonomic nervous system (also morphologically through nerve fibers and fibrillar bands), just as the cerebrospinal system is likewise connected histologically with the sensory surface and the muscles. First in the mid-brain, or in the cortex, the corresponding paths and centers join; and in the cortex it is probable they join in such a way that the representatives of the sympathetic and the autonomic systems (sensory motor cells and cells which store up impressions of stimuli) are distributed over the whole cortex, most abundantly, to be sure, in the various well characterized "sensory spheres." Where the representation according to limbs and sensory organs is most pronounced paths go out to the various inner organs, in a particularly abundant manner. Their functional strength may be represented more through collective functioning of the nerve-cells (mnemic activities) than through participation of particular, specific individual cells.

The diffuse modes of disseminating visceral stimuli in the cortex may easily be imagined as mechanical in such a way that every stimulus complex from the abdominal organs as it becomes manifest, when through the mediation of the interbrain it has passed into the cortical conduction paths or to a certain favored part of the cortex, is distributed as soon as it enters the cortex and is inscribed in the cell groups as by the operation of a pantograph provided with numerous pencils, as soon as the proper lever is put in action.

Such a diffuse inundation of the cortex by "emotional stimuli" may be indispensable, in order that every impression (element of experience) corresponding to an original sensation may be provided with the "emotional quota" belonging to it. But of course these are only hypotheses!

The influence upon one another of the sympathetic, autonomic, and chromaffine cells, or blood glands, requires a clearer elucidation by application of a few modern pharmacological and cyto-physical experiences. In the reciprocal exchange (taking in and giving out) of certain materials in the visceral sensory cells, the chromaffine cells, and the blood, may perhaps be sought the material basis for the life of the instincts, especially for the tension and discharge of the emotions. Osmosis, that is, the osmotic pressure, may here be granted a deeper physico-physiological significance.

Primarily there is implanted, at least theoretically, in every isolated living cell, the capacity to maintain itself from within, although only for a very short time, and probably even to produce germinal "emotion." As soon as the division of labor has begun in the multicellular organism, then for every distinct functional form as we have already seen, distinct tectonic "specializations" are provided (through successive engrammes), while in doing so the fundamental coherence between the single cell-groups, that is, a certain primary grouping, is not abandoned.

The organization of the higher emotional life now might evolve, in my opinion, on an entirely similar basis. In the division of labor and differentiation of the nerve cells, very probably, the chemotactic and the pharmaco-dynamic, that is, chemism, plays no subordinate rôle, a fact which may be assumed from the perfecting and thriving of the individual animal. The special organs are created at this period. At this point, one may call attention also to the results of investigations by Overton and H. Mayer on the osmosis and in particular on the narcosis of the cell. According to H. Mayer, one can differentiate autonomic and sympathetic forms of end-apparatus by the pharmacological reaction. The autonomic react especially to the cholin groups, and are paralyzed through atropine. The sympathetic are stimulated through adrenalin, pituitrin, and cocaine, but paralyzed through nicotine. Cholin is an ingredient in lecithin and in cell lipoid. Psychic stimulation excites the sympathetic nervous system, whereby an inundation of blood with adrenalin takes place through the mediation of the splanchnic tissues. Cocaine and atropine on the other hand create psychic stimulation; morphine, alcohol, opium, chloroform, antipyretics, etc., on the contrary, produce quieting effects.

The points of attack for the pharmaco-dynamic substance in question here are to be sought especially in the old phylogenetic, autonomic, and sympathetic nerve cells, as well as in the spinal ganglia. The other, that is, the kind of nerve cells assigned more to the "orientation apparatus," behave in a refractory manner to most of these chemical substances or are even passive at least to small doses of them. The narcotics have the peculiarity that they dissolve the lipoids of the sorts of cells just mentioned; in any case, this applies to the effects of alcohol, chloroform, morphine, etc. In this way, favorable conditions are provided for osmosis. The operation of these remedies is first of all shown in the fact that they deaden pain temporarily and then produce sleep. In many nervous areas they reduce tension, and promote the feeling of relaxation, soften the collision of emotional currents, and bring us rest. Still other effects, too, namely, such operating in the cellular membranes, can be considered in this connection: facilitated supply, perhaps also the delivery of ferments, enzymes or poisons acting as ferments in the cellular complex falling under consideration, probably within the various "excitable regions"; from the nerve cells of the autonomic and cerebrospinal ganglia all the way up the long succession of the descendants of these, migrating corticalwards in the course of phylogenetic evolution. After a certain time, the narcotic influence, as is well known, introduces as a secondary reaction, general fatigue and probably nausea as well. Could not a protracted secretion and expulsion of the discharged products peculiar to the cell, and the demand of the cellular protoplasm for restoration to biochemical equilibrium, correspond to this condition?

The instances just now discussed bring before us the following question: Might it not be possible that substances setting free lipoids and facilitating supply of ferments (just as with the narcotics) could be produced in our body regularly, that is, according to law and need; and for the production of such substances would one not take first and foremost into account the internal secretions, that is, the hypophysis, the adrenals, the thyroid, the epiphysis, the epithelial bodies, or the chromaffine system? Moreover, the sexual glands certainly would come into question at this point. The continued coöperation of these glands in the development and growth of the various organs of the individual could not be doubted at any rate. They could produce suitable chemical materials (sperm, etc.) according to requirements (periodic) just as the adrenals produce adrenalin, as the thyroid, thyreoglobulin, etc., and supply such secretions to the central nervous system according to the measure of the need of the nervous elements in question, in part through the cerebrospinal fluid (after filtration in the choroid plexus), and so in appropriate ways come into use in the development of the sexual emotions. Would it be absurd to assume that such secretions stimulated through phenomena in the interior of the body, as well as through outer stimuli (experiences) would supply the chemical basis for the feeling of fatigue, for sleep, for euphoría, for the need of food, and for many other appetites? (Material basis for fatigue, for intoxication, for excitation of libido?) In my opinion, no. Such an assumption for sleep and activities of the sexual organs has long been discussed but is lacking none the less in positive evidence and demonstration. Beyond adrenalin, pituitrin, thyreoglobulin (Oswald), we unfortunately know little of the chemical substances furnished by the blood glands which have come into consideration—little concerning the chemical materials supplied in the internal secretions. From the occurrence of many characteristic influences of stormy and sudden events in our emotional world, or appetites, it is easy to infer a fermentative mode of functioning on the side of the emotions.

From the other materials produced in the blood through metabolism or supplies to the blood, one might take into consideration cholin, lecithin, calcium compounds, etc., materials which play a not small rôle according to experience (H. Mayer) in the demands and activities of the autonomic system.

According to this viewpoint, one would consider also, of course, the regulating or adjusting function of the sympathetic nervous system, which controls especially the innervation of the adrenals, and which receives in turn stimuli proceeding from the chromaffine system. Moreover, one should not forget the immense rôle which devolves upon mnemic stimuli, that is, those sorts of stimuli inaugurated through impressions stored up (personal experience), and carried over to the present.

The ideas just now developed lead us further to the question concerning the more precise distribution of the sorts of stimuli in the central nervous system serving as a basis for emotions of the moment, and becoming effective in this manner. How does the election of definite forms of stimulation occur here; how does it arise out of the manifold stimuli-collisions in the central nervous system? As with "sensation" and stimulus is there an alliance and conduction-insuring result, on the one hand, and on the other inhibition and breaking of contact for those stimuli hindering success, in the sense of a certain reciprocity, which plays an important rôle? Is it not conceivable that under definite conditions, there might be hypersecretion or hyposecretion of certain materials furnished by the endocrine glands, for instance, of adrenalin, and that they might influence true points of attack for the decision of stimuli-collision, in a definite sense, or for the victorious emergence of a well-defined emotion of such import as decides the issue? One could represent to himself that even in the sphere of "emotional choice," the reciprocal inhibitions could be brought into play on the scene, that—probably also without alteration in the composition of the inner secretions—the emergence of a very definite emotion would be determined through self-enforced restraint of the sorts of emotions opposing the success of this stimulus; the depression would "deaden" the temporary feelings of pleasure and expansion, or repress this last to a considerable extent, or vice versa. We might further take into account as important for the denouement of the emotional collision in the positive or negative sense, the family heredity, education, imitation, habit, immediate individual interests, capacity for rational thinking, etc.

What rôle does the flooding of the blood with adrenalin play with reference to strong emotion, that is, in liberating passion? Such an inundation is an experimentally demonstrated fact (Cannon, Asher, etc.). Is it a question here of furnishing means of defense against other still unknown substances of the inner secretions, or of a stimulus intended for the purpose of promoting the most important individual life interests against higher, ethical interests? Or to bring us in general onto a good condition for conflict and to kindle "life" within us? At the outbreak of the affect is only adrenalin secreted in abundance, or are there still other similar substances, of which the same can be said? Does not perhaps hypersecretion of a particular substance at the outbreak of a passionate emotion, in erotic feeling, for instance, correspond to a very different substance from that in anger, etc.? These and the questions raised above naturally create to-day still deeper, more obscure enigmas. In venturing towards their solution the aim is that we may be spurred on to thought, remembering always the many difficulties that intrude in this sphere, even in orienting ourselves, however roughly, in the biological sense.

In any case we do well in general in all hypothetical assumptions to take into consideration in an explanation not only the bio-physical but also the bio-chemical modes of functioning just mentioned.

In respect to what now concerns the anatomical point of attack for the numerous forms of emotion corresponding to more delicate processes in the central nervous system, we must remember in this connection that the affinity of the various sorts of nerve cells for the different bodies floating in the blood, varies greatly, and that the autonomic system is excited or paralyzed through different chemical bodies from the sympathetic, and, further, that the centers in the oblongata certainly react to toxins in other ways than in the cortical cellular system. In the distribution of stimuli in the sphere of the emotional world, a prominent rôle very certainly is played, moreover to emphasize it once more, by not only the chemical combinations that have accumulated in the blood (ferments?), but also above all by the very different temporal (also historical in the evolutionary sense) constructions of latent forms of stimulation in the cortex; that is, by the periods of acquisition of certain forms of emotion (for instance, that of sexual emotion).

We see: Valuable and new as is the viewpoint which bio-chemistry can supply in the study of the problems of emotion, yet the bio-chemical aspect is much too one-sided and indeed too barren to serve alone as a basis for the conflict for precedence of the various psychic emotions. In my opinion the greatest significance and fruitfulness in the study of the emotions must always be ascribed to the biologico-psychological viewpoint, which to be sure must keep pace with the results of bio-chemical and bio-physical inquiry. In the "psychic" emotions and altogether in morality, it is a question, as is generally known not only of phenomena taking place in the immediate present (in which bio-chemical processes play an exceedingly prominent rôle), but also of the totality of experiences built up and evaluated according to the individual and social life interests (the individual mneme, then the endless series of experiences more or less emotionally colored, that is, engrammes). Experience, habits of life, and the differentiation of the emotions closely linked with them, have created by degrees strong emotional values in the various kinds of animals, and the individual experiences have elaborated them still more richly, all on the basis of the most important life interests. It will be of importance consequently to study in greater detail first the development of the emotions in the child with regard, at the same time, for the evolution of the finer tectonic structure of the central nervous system.

The point of view excellently adapted for understanding the pathological psychic factors of the emotions and of the physiological processes closely interlocking with these, is that which (while making far-reaching allowance for phylogenetic evolution) proceeds from the continuing growth of the emotions in the child, and follows up their successive stages of development and structure. The emotions ("somatic emotions" and basic instincts) depict the strictly primary elements; they create and control the wider "answers" of the nervous substance, and in this way lay the basis for gnosis and causality. Emotions without attendant "ideas," that is, emotions equipped with only a rudimentary basis, that is, fragments of orientation in space (first at the mother's breast) and with the most elementary gestures, we observe only in the new-born. Already they give evidence there of an unmistakablle division into impulses and wishes, into movements which indicate pleasure or displeasure, or pain, and into emotions of "discharge" (satisfaction and rest). On the way to the realization of the wish, in the emotional transition from tension to release, we encounter in the child expressions of displeasure, pain, impetuous will, even to passion or pleasure, comfort, satisfaction, according as this process produces an unpleasant disturbance and interruption of a satisfactory outcome. The infant appeasing his hunger at the mother's breast seems to luxuriate in immediate satisfaction, and it is easy to understand how certain authors have designated this emotional phase as "auto-eroticism" (Freud). But the gratification in the reception of food has only a single quality in common with sexuality, namely, satisfaction (relaxation of tension).

The morphological expression of the successive becoming of the emotions and appetites, with all the attendant phenomena in the realm of sensation and excitation, is furnished by the increase and the systematic development of the nervous elements and connections, later also by myelinization.* This impulse towards growth and differentiation one can represent theoretically as a process running parallel to the continued impulses in the building up of nervous performances, in such a way that an "original emotional impression" corresponds to a minimal morphological factor. Of course one will be able to demonstrate objectively this minimal developmental change enacted in the space of a second, neither microscopically nor chemically. If for no other reason than for the reason that often indeed the same nervous elements will be made use of in very different stimulus combinations.

In the new-born child there are, to begin with, as stated, only "original emotions"; somatic emotions, pain and pleasure, etc., and at best very weak original sensations. The mnemic emotions and sensations arise at first gradually a few weeks after birth. The first germ of orientation in space, with which "engraphie" and thereby causality also (first coördination of motive and execution) are set in play, and makes its appearance after the first month, and by about the third month orientation in space and coördination in the child's own body is reached, simultaneously with the first reflex motions involving orientation and with completely functioning vision. From this time forward, every vigorous drive founded on the narrow interest sphere of the infant is accompanied by an appropriate flaring up of the psychic emotions as soon as he becomes aware of memory pictures of known emotional tone; processes which exercise and perfect themselves daily in related impressions, and increase in strength and significance.

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* With reference to the ability to study behavioristic components and their emotional concomitants by the myelogenetic microscopical methods see an important contribution by Tilney and Casamajor, *Am. Arch. of Neur. and Psychiatry,* September, 1924. [Translators' note.]

Every newly awakened emotion connects itself to previous ones liberated in similar situations. Thus there are "emotional products," "reproductions," "double reproductions," etc. These are compared with earlier ones of different sort and are distinguished in a vague way: certain ones are preferred, others refused, that is, are evaluated in accordance with some necessity. Thus it happens that towards the end of the first year there is already a well differentiated scale of emotional drives. Now the child comes into a new period, where every vigorous impulse awakens not only adequate images, but especially discounts future values, and where according to the nature of the impulse, expectation, hope, fear, disappointment, are added to the emotion of the immediate present, and fuse with it. Moreover a positive emotion automatically stamps out and suppresses the negative, in a vigorous release of the emotions, and vice versa.

The more the world of experience increases so much the richer and more differentiated becomes the emotional register. There are now strong latent values (not only love, hate, joy, anger, but also transitional and intermediate steps of such emotions, as for instance, surprise, humor, teasing, playing, confidence, etc., later also, right and wrong).

The first steps in a differentiation of the emotions originate in individual experiences and in the psychic working over or elaboration of these, and have as their basis: above all the most important life interests (or emotional values) of the individual (self-preservation), then of the species (preservation of the race), then of the tribe and group, and finally the prosperity of the whole world (even from the more lofty viewpoint, beyond the individual), that is, universal perfection. This differentiation is won in the continued conflict of the various instincts and emotional values for precedence among themselves, whereby now the interests of the individual in the immediate present, now such in the future, now more the personal, now more the unaccustomed and strange, bear away the victory. The umpire represents reason, that is just beginning to show itself. We find traces of this conflict, though not always perceptible from without, *i.e.,* in a latent form, already in the child, at any rate already in the pre-school age.

In the building up of the emotions and the emotional values in the child, we can discriminate the following periods which overlap one another:

1. Period of the purely instinctive life, when in the psychic dawn of life (of the first three months) the interest of nutrition and of bodily comfort exercise exclusive authority.

2. Period of the first discovery of orientation and of the child's own body. Coördinating activity of the senses and construction of the world of sensation. Now begin the primitive modes of expression, with positive or with a negative stamp (true laughter, true weeping, that is, not merely crying aloud).

3. Period. Awakening of joy and love, of fear and anger, of inhibition (yes and no!), etc. First use a definite feeling register (six to twelve months).

4. Period of the symbol, especially of the symbol of speech. Beginning of the desire for affection and praise. Strengthening of the feeling for the prohibited, feeling of guilt and punishment; on the other hand, the feeling for affinity, of thanks, etc. (until the third year).

5. School period. Development of strong moral values, understanding of industry, appreciation for the noble, judgment of naughtiness and of ostracism, desire for having extraordinary accomplishments, strengthening of the foundation of personality. Symbol in games and competition with comrades, awakening of ambition.

6. Puberty. Awakening of sexuality, that is, lively curiosity about sexual questions. First sexual currents and eddies (at times of a perverse nature, perhaps with a deep "tragic" character). Stronger emphasis of the personal future and impulse towards more definite, more distant goals. Longing, hope, striving for reward. Eager cultivation of companionship, beginning of consideration for the interests of others, gradual formation of the conception of honor, development of the sense of justice, of social obligations, etc. (about thirteen to eighteen years).

7. Period of preparation for career, and the first activities toward it. Stronger aims and plans; stronger striving towards power and results; rivalry, a more vigorous and profound ambition. Releasing of energy, vigorous awakening of interests in higher, more spiritual problems (religion, art, philosophy). More intense desire for voluptuousness (excesses), sexual passion. First striving for feminine favor, search for a life-partner, pressure towards a well-ordered sexual life, with undertaking of responsibility for consequences (about nineteen to twenty-five years).

8. Greater stability. Energetic pursuit of career, and continual

striving towards the fruits of labor, especially towards possession and influence. Founding and care of the family, careful selection of associates, industrious carrying out of social obligations. Period of spontaneous fulfilling of obligations, goals and understandings with wider outlooks. New conflicts in the individual, family, and above all, in national (political) interests (about twenty-six to forty years).

9. Period of clarification and ripening. Family and home constitute the focus. Crystallization of character. Growing significance of life, observation, and energy. The future and the harvesting of the fruits of achievements, the security of life and family and especially posterity receive increased attention (forty-one to sixty years).

10. Period of regained ethical equilibrium. Retreat of passion. Relaxing the struggle for achievement, greater objectivity. A more intense need for inner composure and more frequent glances into the past. Striving for inner harmony and adjustment, for justice, etc. Return to intellectual pleasures, increased care for the future, especially for the family, race, and nation. Striving to build up and insure his life-work. Stronger prominence given to humanitarian emotions. Excessive saving even to avarice. Gradual lessening of interests in new impressions and changes (sixty years to extreme old age).

If we sum up the outstanding grouping of the developmental phases of the emotions just detailed (of course roughly and with allowance for variations), we see that already in relatively early childhood (before the school age), besides the transitory but powerful early instincts, (for preservation, food-getting, acquisition), primitive and embryonic ethical conceptions of permanent moral value are differentiated, (above all in the aspect of what is good and what is bad; what is allowed and what is not allowed, etc.) All these values advance the organization of that which is personally experienced, that is, the capacity to distinguish objects and situations; in other words, the first perceptions of things. An especially powerful rôle in this continued multiplication of individual experiences (at the time when speech is being learned), is played by the tendency toward the perceived image with a somewhat vague, usually exaggerated feeling tone (emotion) and a typical emotional character issuing from this (causality in disguise): curiosity and questioning. Of course, at this stage of development where the "gnosis" and the "practice" and the symbol for the first time take root deeply, one can not yet speak of a sharply defined morality. However, one must notice that the impulses to development are very noteworthy in this direction and are characterized by precursors and advance signs (in the sense of a tendency to self-preservation). Always however, crude self-preservation (also protection and preservation of the separate organs of the body) and the wishes directed towards this, the blind impulses command the field.

The sexual world, that is, the impulse towards preservation of the race (even to care of, and anxiety for, posterity), germinates usually in saltatory manner, sometimes before expected periods of development, with some degree of activity (blind interest in the other sex, erection, and masturbatory manipulation), but such appearances are sporadic and usually only temporary. Nevertheless it is certain that the sexual feeling which later plays so important a part, can be released long before the real puberty and in manifold form, and that in the building up of morality—before detailed experiences in this field are assembled—it plays a latent rôle (shame and shamelessness). Nevertheless we shall not here enter into detail.

How does the morphological basis for the development of the emotional world that has just been sketched in brief, behave? Does this factor find expression through ripening of the elements, through new tectonic differentation, perhaps even through myelinization? Perhaps all this has something to do with it, but we have little detailed confirmation of the fact. The maturity (differentiation of the nerve fibers and the ganglion cells, and formation of the medullary sheath) begins in the vicinity of the end-organs (ganglia) and also in the spinal part of the embryonic medullary tube, relatively early, that is, already in the third and fourth fetal month, and the whole metameric system, with reference to the myelinization in motor and sensory nuclei, does not tarry far behind, excepting in the cerebellum, the midbrain, and especially the cortex. In the myelinization phases of the nursing period neither in the brain stem nor in the neoencephalon can anything certain be recognized with reference to the building or differentiation of the elements, which can serve the instincts of an anatomical basis. Myelinization in general even in the cerebrum takes place through very distinct bounds which upon a closer observation seem to flow one into another, and these doubtless disclose a certain parallelism at least with the development of the world of sensation. The building up of the emotions goes hand in hand with the building up of the sensations. One must in the meantime bear in mind with reference to the former that they really represent the product of a continued reciprocal activity between the visceral organs especially the endocrine glands and the visceral ganglia and the central nervous system, and that this activity does not necessarily come to expression morphologically in a definitely demonstrable way. The richest performances in the field of emotion take place, if one may localize them at all, where the world of sensory sensations have their central representation, namely in the cortex, in the superior granular cell layers, where the small, histologically badly differentiated elements (polymorphous strata: small nerve cells with richly branching axones) lie close together, embedded in a rich fibrillary substance, and defying every morphologico-tectonic organization. This layer develops very late: the tangential fibers (inclusive of the Kaes-Bechterew layer and supraradial "wicker-work") receive their myelin first in the school age and sometimes later!

One can represent to himself the further development of the brain (from the beginning of myelinization on) together with the finer construction of the psychic performances, as a continuation of the histo-tectonic development in the sense of a finer, morphological completion of those paths of innervation upon which the strongest claims are made in life, either in daily use or in education. The forms of excitation most frequently and energetically entering into activity are, other things being equal, the most resistant just as are the structures (morphological) serving them as a basis, granted that we presuppose a participation of the glandular secretions. The individual innervation impulses (inclusive of ecphoric performances) can naturally be constructed only theoretically—as incalculable impressions following one another. The pathways established and inhibitions which occur in this process must also be looked at from this viewpoint, and will receive their firmer foundation later when the pathological nervous phenomena are discussed.

Certain it is at any rate that the primary instincts as the oldest phenomena in the sphere of the emotional life, and also in the adult life, are most capable of resisting all life insults (at least up to a certain age), and that the altruistic emotions grafted upon the primal instincts (social feelings and world feelings), can only flourish and come to perfection if the somatic, that is, physiological and biological conditions are rightly fulfilled (exercise and education). It is well known that it is easy to shatter these new structures by influences threatening the vital interests (outbreaks of passion); but it is not easy to destroy them and then the game belongs entirely to the primal instincts.

The heavy inner conflicts and other soul insults, even unfulfilled wishes and inhibited instructive impulses, prejudice, we know, the perfect functioning of the sympathetic and the visceral nervous systems, and therewith too, the secretions of the endocrine glands. But more of this at another time.

The most wonderful thing in the structure and organization of the " emotions " in contrast to the " World of Sensation and Orientation " is the dependence (worked out to the finest point) of the ganglion system belonging to the former, on the condition of the whole cellular economy in the human body, and especially on the " good or bad functioning " of those organs representing the most vital and most immediate interests in life, that is, of respiration, circulation, nutrition, and the sexual organs.

For the physiological performances governing the arrangement, holding together, and finer distribution of the " interests," two more widely regulating apparatuses are necessary—beyond the visceral nervous system and its cortical representation:

(a) The system of the endocrine glands, with their secretions and ferments. They furnish trophic material not only to the visceral ganglia, but also to all the higher representatives of these, above all the " food " for the emotions in the cortex: bio-chemical component and

(b) The so-called exteroceptive or the orientation system serving the sense organs, differentiated as it is with extreme fineness: world of sensation, the Department of the External. This bestows on the crude structure of the emotions and instincts, the necessary differentiations according to individual experience and causality, and gives it historical organization, in conformity also with higher purposes, on the basis of " apperception " (Steinthal) and of speech. It supplies finally, the somatic foundations for the proper resolution of the innumerable personal interests and impulses, as well as of the emotional conflicts in the present and in the past. Through higher modes of functioning, the " World of Emotions," thus built up, is brought into greater power, which controls the primary impulses in the interests of higher biological values. Even the intellectual world itself is converted into a compliant instrument. It is indeed the world of instinct resting in the latent states, and reaching the threshold of consciousness only painfully and incompletely, which sets our activities in operation.

It is a phenomenon which is not less noteworthy, and one which is especially important for neurologists, that the results of the reciprocal activities of the apparatus in question (ganglion system, blood-glandular system, cortico-associative system), results which are registered and fixed from moment to moment in addition to the suitable " emotional censor," may not only be reillumined (ekphoric) and brought to conscious remembrance in associative and other ways, but in their reproduction the affects produced in the first "experience," in addition to the bodily (visceral) phenomena accompanying them, are again manifest, to be sure, generally in diminished form: for instance, blushing on remembrance of a painful situation, erotic excitement upon allusion to a love scene once enacted, a flow of saliva on following a description of gustatory gratifications, and so forth, and also for instance the Pavloff experiment on conditioned reflexes in dogs, and so forth.

In the building up of emotionally colored memory images there is, however, a force effective even in the most minute bio-chemical processes in the body, influencing and bringing them to ekphorie. This latent sensitive moment maintains our perceptive faculties, that is, our instinctive life, constantly on the alert. It is a well known fact that in the innumerable emotional values stored up within us, through continued experience, and ever more delicately differentiated, those most powerful at the instant of conflict, advance together in vigorous concurrence, and can release the most various conflicts of all levels of emotion (from passion on up to morality) even to pathological exhibitions. The explanation of this will follow in the chapter on the pathology of the emotions.

CHAPTER V

Recapitulation of the Preceding Material

1. The most practical classification of the emotions is according to their historical or phylogenetic development, on up to homo sapiens and ontogenetic development. From this total development or history we learn that there persists first of all a blind impulse towards thriving and perfection, first of the individual, and then of the rest of the world, from which it arises, and indeed after the death of the individual, or as it may be, after the death of the cell. This pressure towards perfection is characterized by assurance against decay even of the coming generation, and may be at the cost of the individual (self-sacrifice of mankind). This is the primary ethical emotion, which as a minimal trace or germ may dwell within the living protoplasm even of a single celled animal, and which presents to us the incomprehensible primary cause of all morphology of the nervous system and of the emotions, even to morality. This primary emotion has the purpose of caring for the most worthy, later of the most noble life interests, the values and precedences of which are determined by social life, that is, through education and culture.

2. The emotions may be divided into " somatic " and " psychic " (of course with transitions). The first are for the most part inborn, and belong to the immediate present (determined by immediate stimuli). The psychic are built up in a temporally complicated way (in part, a fusion of derivations from various developmental phases of life and of experience). At any rate, they constitute the results of experience through the mediation, and on the basis, of the " world of sensation." Their aim, as has already been observed, is not only individual growth but perfection in the broadest sense. The biological means to attain all ends are: first, respiration, the reception and acquisition of food, individual defense against hostile attacks, their guarantee of the future of the generation (selection and reproduction), collectively, and so forth, in brief moments which guarantee that the foundation from which man has sprung is firm and sure. The objects of the " vital interests " are: the individual, the race, the clan, but also the wider interests of the world closely connected with the true interests of the individual (the search for God). The values are altered during the individual developmental life (phases of life),

and gravitate with increased individual experience, self-education and culture, ever towards the future, that is, towards the coming generation and at the cost of the individual. This comes to pass gradually and with variations; in the period of childhood, the selfish interests predominate (true egoism; primary basis), thereupon follow successive sacrifices of these interests, at least in part, in favor of the family, the kinsmen, the nation, and the ideal world interests (religion, humanitarian aims, altruism).

3. Out of the primary emotional values and fundamental aims (currents of the will) a multitude of special emotional values evolve to attain corresponding, related ends; the feeling of power, the sense of industry, acquisitiveness, the guarantee of existence of the family and the nation, even to care of the welfare of mankind, and at last the impulse towards union with God and the universe. Here there are a legion of special interests and values, which continually lie in opposition to one another. In fulfilling the immense special tasks of life that change from situation to situation, there occurs consequently inner collisions and conflicts, struggles for precedence of the innumerable emotions in question: " What shall be sacrificed, and what interests sacrificed to what others? " In the majority of conflicts, the struggle means that the direct, conscious individual emotions (instincts; Schopenhauer designates even morality as a victory over the will to live) should give way to those controlling the growth of the family, of humanity, and so forth.

4. The finer individual structure of the emotions and of morality is dependent on the nature and content of the personal experience (derivations and results of this), on education and practice. Only the most vigorous and in general the best known differentiations of the emotional values can be brought to expression through customary speech and symbol, as definite social aims.

5. Since all emotions present a definite relation between " tension and release," that is, a certain phase of the struggle for precedence of definite emotional values (" bodily " and " spiritual," personal and altruistic interests), it follows the noblest emotion is built up on opposite, that is, on latent collisions between higher and inferior emotional streams. Thus is explained the fact that eventually baseness and nobility (with a slight surplus of the one or of the other) can dwell in the same breast, side by side, even if not in peace.*

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* In this connection Kempf's monograph on the Autonomic Functions and the Personality, Nerv. and Mental Monograph Series, No. 28, is of interest. [Translators' note.]

Since every free living cell in the world bears in itself a germ of "will" (rudimentary will), that is, of instinct, it follows that we may assume that every cell in the human organism has a share, even if most minute, in the total emotional life (individual cellular emotion, individual cellular mneme). Through the potent division of labor, which begins in the phylogenetic development in progressive manner, special organs are now created, especially a central nervous system (the visceral and the somatic with the frontal end). Therewith is inaugurated in rich measure the creation of "special faculties" as well for the sensations as for the emotions. Nevertheless these special faculties do not undertake to carry on all this work; there remains rather a certain minimum capacity to create emotions in the whole cellular state. The complicated forms of emotion and sensation built up on the basis of individual experience acquire meanwhile a further elaborated special apparatus (chronogenically localized) within the brain and especially the cortex, and the visceral glands are entrusted with the "feeding" even of the cortically represented "emotions," and indeed with the secretions supplied by these. The world of the emotions takes the largest share in the phylogenetic and ontogenetic differentiations of the central nervous system; indeed it is the true, living cause thereof.

The physiological component of the emotions consequently seems to be on the one hand the product of the functioning glands, and on the other hand the product of the visceral and sensory cells and of their satellites, as well as of the fibrillar bands (molecular substance). Without doubt these glandular cells furnish the "chemical material" to the nerve cells continually, with a view to building up the emotions ("material" component), and this comes to pass, according to the combination of the stimulus phenomena in the central nervous system, in one of the forms or qualities which is conformable with the different biological aims (close reciprocity). Originally the "physiologico-chemical (primitive) material" for the production of emotion (in single and multicellular organism) must have been united in a single cell, just as it was for the rest of the nervous functions. With the beginning of a division of labor in the organism, arose meanwhile specific cellular forms and later apparatus even in the regions for sensibility, for every physiological, special activity and above all the Leydig cells made their appearance.

The influence on the nerve cells coming under consideration here, through "inner secretion" must be already quantitatively extremely diverse; it exhibits itself at one time in the immediate present (stadium of actuality; ferments or oxidation ferments?), at another time in periods of varying compass; latent, periodic, wave-like forms of stimuli. But even the finer chemical composition of the secretions may vary greatly in various ways according to the quality of the emotion (antagonistic secretions of the hypophysis, thyroids, and the adrenals?). In regard to the chemical structure of these secretions, we know to-day, to be sure, only that of adrenalin and thyreoglobulin (Oswald). The cerebral nerve cells can excite the visceral nerve cells through mnemic stimuli (ekphorie) to prompt action, whereby again other cerebral nerve cells can be excited retroactively and new emotions awakened (?)

Psychologically the emotion is considered as a conscious momentary result of manifold subjective stimuli in our body. It is something fused with the ideas, born subjectively in the immediate environment, in part (pain, hunger, and so forth) endowed with spatial characteristics, and always with a quality tone of the something, however, that orders and utilizes past and future according to causality.

Physiologically the emotion can be conceived of as a gripping subjective tension striving for discharge or satisfaction, with an endless number of layers and accompanying values laid upon one another, descending to the most various phases of life, and temporally overlapping one another. The emotion is dependent on life-chemism, and is provided with ascending if fluctuating tendency towards perfection, even to the generations of the most remote future. In the ascent of an emotion, the single values foreign to the aim that one strives for are inhibited; they are pressed into an indefinite latent state (suppressed and subjectively thrust out), and others chosen as "confederates" (allied emotions). Hereby the excesses of definite forms of emotion in the immediate present arise, representing the impelling motive of our activities. Through these perpetual phenomena, the world of sensation in the sense of a wise (or unwise) economy of life is further differentiated and built up (reason).

Questions of localization. To every cellular element and to every "emotional apparatus" collectively entering into function in the present moment, in the central nervous system as well as in the visceral organs, is assigned a special, individual, or collective rôle in the building up of the emotions. A spatially definitely circumscribed separation of this apparatus from that of the "world of sensation" is only possible within the primary "executive structures" (system of the visceral and sympathetic ganglia, area of functions in the spinal cord and in the brain stem); *i.e.,* paths of conduction for pleasure and pain. The chief stations for the higher emotion (consciousness) is certainly in the cortex where, however, several distinct structures, that is, structures closely connected with the periphery, have a sharply outlined innervation area. An island-like cortical representation or a cortex representation can be ascribed to the emotions as little as to sensory perception.

A limited, "chronogenous" localization in the cortex can be assumed theoretically, nevertheless, for certain innate emotions in the following sense:

(a) In the form of an optimal innervation path from the periphery (emotions immediately liberated); these might coincide in part with the various innervation regions for the various bodily parts and sensory areas (the zones for the extremities, and so forth). The representations of the sympathetic and visceral nerves, nevertheless, might not be excluded from any cortex area of the brain upper surface.

(b) In the form of successive incidents and experiences, which proceed parallel with the biological development and run parallel with the finer structure of the central nervous system, and live latent within us in the form of engrammes temporally built up in a complicated way and united through causality, and which are accessible for the ekphoric stimuli (that is, memory) of any time—no matter what place receives them in the order of their acquisition in time.

(c) The peripheral visceral and sympathetic nerves and ganglia within their "individual and collective mnemes" are indeed never wholly passive when the corresponding emotions become manifest or repeatedly manifest (central reproduction). At any rate, in my opinion, a biochemical (material) component, supplied through the secretion of the endocrine glands, even though only in minimal measure, is necessary for the production of emotion arising in the immediate present. The sphere of affective functioning of this component at the time can not be more definitely indicated.

CHAPTER VI

PATHOLOGY OF THE EMOTIONS

The content of any instant that is experienced within us is composed of single emotions, which, on closer examination take the form of a kaleidoscope albeit to some extent systematized according to the biological emotional values. Such a content represents the result of an arrangement of the separate phenomena according to a scheme of their occurrence (phases of the past), and of their vital values, which are manifold and in part opposed to one another. We experience in the "splendid instant" (Goethe's "Faust") not only emotions created at the given moment but we experience also kindred feelings belonging to the retrospective past; and in doing so, experience the future emotionally. In other words, our feeling in the immediate present constitutes a profound and complicated movement to the soul; it represents a transition of the past into the future with all the "seasoning," and often the transition from tension to the desired discharge. These processes we now stamp with a favorable or unfavorable "common mark," ever in conformity with the constellation of the permanent factors in question. In conformity with the censorship with which we communicate our affective state, our mood is determined.

All possible phases ("temporal strata") and situations of the conflict among the vital interests, from indifference and Homeric psychic calm with excess of a positive emotion (equilibrium of the affect), on up to the most violent passion (assault of primitive interests) may fill the moment. The regulator and the most important weapon in this struggle representing the passing life of the soul is furnished by ideas ("memory images" and their causal derivatives) and particularly by reason, the representative of the noblest human interests and at the same time the representative of the most distant future, in contrast to the instincts which protect the immediate life of the individual.

Innumerable currents of emotional forms, sometimes occurring simultaneously, strive in us for discharge, of which the larger numbers are unconscious, from hunger for air up to the most exalted moods; many are worn out in a short time, often in transit; many are "rewritten" or transformed (the colliding emotional currents playing one against the other unconsciously). For appreciation of the moment of conflict and the duration of the reaction (collision of the emotions) as well as for the critical examination of the relations between the inner and outer causes of the conflict (incidents, appetites) and the intensity of the conflict (agitation), we possess in daily experience a certain elastic measure that we designate as the norm. Where this norm is not overstepped in a striking manner, we conclude that the emotions are normal.

This norm can indeed be broken through and overstepped in various ways: the vigorous release of the emotion (affect) is always accompanied by somatic phenomena in the sphere of the sympathetic and visceral nervous systems, or of the inner secretions, and this latter again, if corrected by opposing stimuli, may supply us also with the most effective weapon for the control of outbursts of psychic disturbances. Here again without exception the interests in life considered most momentous to us at the moment and to which we wish to supply values or to protect from menace and injury create the object of the conflict. The aim is assurance of our individual life, and also that of our descendants, as well as of our beloved fellow creatures. We may designate an exaggeratedly long psychic response or a periodic one, recurring spontaneously, to an offense to our vital interests, above all if that reaction is characterized throughout for us by accompanying somatic phenomena (cortico-spinal and visceral) of annoying intensity, with manifold reciprocal effects, simply as nervousness or neurosis (often it is already a question of a psychoneurosis); and, too, if the subjective causality (that is, the subjective interpretation of the relation of cause and effect) lies wholly in the territory of the offended interests of the individual, and the offended subjective feeling of being injured becomes the point of departure for the whole judgment of the situation (egocentric condition). As is well known, every strong emotional impulse—in particular bodily pain—even in healthy persons, forces to a degree of subjective causality. Such an emotion arouses not only the desire to understand its true location and duration within us, but makes us inquire into its true cause, and to reflect on the possibilities of its issue, and finally on the wider consequences for the future resulting from this affliction. If we discover a palpable cause of pain, and if we see a possibility of its speedy removal; then this result of our reflections allows us to illuminate the future with favorable light; we conceive hope for a speedy release and are quieted, even if at the same time the bodily pain continues with equal intensity. If this is not so, our psychic distress can continue unchanged even though the bodily pain for the moment is insignificant; indeed it can even reinforce the bodily pain. In the neurosis, the subjective causality (the imagined cause, often in the sense of unreasonableness) blocks up the path to a successful solution; sometimes, however, even in the neurosis, the insight temporarily erring, finds the right way, as soon as the subjective difficulties are to some extent done away with.

A psychosis results when the individual is forced to assume a false position of defence toward the outer world because abnormal emotions with false relations persist, and because the false relations of the individual to the external world (which can extend even to total lack of critique), compels him to assume an attitude of defence;* in other words a more or less quarrelsome opposition between the individual and the outer world. But, as is well known, the psychosis can also be characterized by the overactive, expansive inclination of the individual towards the outer world, in the sense of an aggressive tendency or impulse to make the outside world happy, to become master of it, and in the sense of an excessive inclination towards enterprise, towards activities of which the patient constitutes the central foci, and so on. But here they are always seeking protection of their own peculiar vital interests which, they believe, are imperiled, or protecting the interests of others; or they desire to attain their own high-strung wishes, or further their own interests or those of others, even to the extent of using force. All these changes in disposition are combined of course with the beginning of intellectual decay, disturbed orientation, with hallucinations and delusions, with many inhibitions or slackening and displacements of the relations between the world of sensation (experience) and the world of emotion—dementia precox—with an agitated and intensified condition of the will. The final stage consists in dissolution of function in the intellectual and emotional spheres, even to a fragmentation (confusion) and complete decay.

Visceral-nervous symptoms in the adult—The viewpoint of considering the neurosis as a protracted or faulty reaction of the individual to injuries to his personal vital interests, to unfulfilled (justified and unjustified) wishes and hopes and so forth, cherished and ardently desired by him, concedes an enormous significance to the etiological, that is, to the genetic historical factor. The developmental, that is, the genetic factor, forms a viewpoint that plays a wonderful rôle in the total biological knowledge. This view assumes as its point of departure the successive urge to "become" of things, from the creative phases, from the temporal (historical), exactly organized construction of the nervous functions as a whole, and having regard, on a broad scale, for the constant reciprocal influences of the manifold impelling forces, both inner and outer. It points to the fact that all living creatures are in a progressive or regressive state of fluctuation. Moreover, for the origin of the neurosis, the biological factors are decisive; the quality of the germ, its intrauterine development, then the early education and experience in childhood (injuries to the vital interests even during the embryological period of development). In other words, the history of the evolution of the emotions remains under the constant influence of the same forces which have fashioned the organs and the nervous system. It is a question, then, of a true circuit. Pathological stimuli (poisoning, even autointoxication), diffuse and inflammatory processes early acquired (both in the meninges and in the cortex) play a special and certainly not wholly unessential, even if not decisive, rôle in the development of nervousness. However, they are not directly responsible for the origin of the neurosis, just as little as are other locally limited, acute cerebral lesions (for instance, foci of vascular nature, trauma, tumor, and so forth) or excessive demands on the brain (in the sense of mental or physical overexertion, without producing conditions of personal conflict). But all the above mentioned moments, which must not be underrated, may delay or hinder the solution of conflicts released by exogenous moments because, like the inferiority of the germ, that is, the anlage, they prevent the natural outlet for the nervous reaction to outrages to personal interests, and direct the different abnormal emotional tensions over a false path, and so on. Enough, we can conceive the neurosis and in large measure the psychosis as an unresolved phase in the struggle for the most important life-interests of the individual (self-support, maintenance of the race, at any rate of human society and community with God or nature, the world), a conflict which may be carried to inconceivable heights or be of long duration. It is a strong, protracted reaction on the part of the nervous system in the sense of a defence against injuries, usually from without (as they happen in daily life) or in the sense of a counter attack or struggle for precedence on the part of manifold, positive emotional values (power, possession, success), as a reaction which controls not only the world of feeling and especially the subjective causality, but also—through the mediation of the visceral nervous system—the inner secretions (defective circulation). Of course, through this struggle or "reaction," the rule of conduct for the affairs, projects, and enterprises of the patient will be indirectly influenced in the most effective way, at all events as far as it is a question of the entirely personal side.

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* Freud's phrasing is "conflict between the Ego Ideal and Social Standard" with wider implications, "Das Ich and das Es." [Translators' note.]

The neurosis may appear, as is well known, in manifold forms, and in every form there are very diverse combinations of symptoms, and also typical variations and phases. Here above all are characteristic the acute exacerbations in the shape of " attacks " or " crises " definitely limited as to duration. In the majority of cases of neuroses unmistakable accompanying somatic phenomena occupy the foreground, and without exception during the exacerbation (" seizures," emotionally toned complexes).

The usual clinical classification gives, as you all know, the following forms of neurosis, which not seldom overlap one another: hysteria, neurasthenia, phobia, that is, the anxiety neurosis, the depressive conditions of hypochondriacal character, simple, temporary " nervousness," and so forth. The outer insults which come under consideration either as essential or as favorable moments where there is predisposition, either innate or acquired (" hystero-neurasthenic variations in the nervous system ") are:

(a) Severe menace or danger aimed directly or indirectly at the individual existence or security (fear, care, bodily illness), whether in the form of a direct, swift attack (sudden attack, catastrophe), or in the form of a more stable situation filled with care and suspense.

Here belong:

1. With reference to the individual life: loss of freedom (imprisonment), economic ruin, plots against life, persecution, and so forth.

2. With reference to the interest of the race: disappointment in the selection of a wife, faithlessness of the loved one, brutal sexual attack in childhood, seduction, rape, attack on one's sexual honor, acquaintance with sexual perversity of all kinds, unfulfilled sexual wishes cherished ardently in secret, and sexual conflicts of many kinds, and so forth.

3. In social relations: violation of honor, slander, oppression, humiliation, exposure, betrayal, disappointment, undermining of authority, loss of dearly loved friends, religious persecution, psychic crisis and trials, then catastrophes affecting the native country, war, devastating epidemics, and so forth.

Moreover, in the occurrence of a psychosis, an essential rôle may be granted to outrages on peaceful life, or the conflicts connected with it (real or even frequently of a delusional nature), even if one ascribes the main rôle to the " endogenous " moments and pathological processes in the central nervous system. In any case, it is a question not only of the threat to the most vital interests of the individual, in the immediate present, but especially of such in the *future*. Of course, to reiterate the insults just now detailed, if a psychosis, psychasthenia, or neurosis is produced, must work upon a nervous system shaken by manifold occurrences in previous life (accumulated poisonings by inner secretions, that is to say, possessing a tendency to disease, through diathesis, independent pathological cerebral processes, or as result of milieu or other influences of manifold sort. In these processes remembrances of similar earlier experiences (homophony) in the form of mnemic stimuli play a powerful rôle determining the special nature of the symptoms. In every offense to the most vital life interests, a "conflict" is occasioned by the production or awakening of inner contrary stimuli (chemical defense of the body, ferments?), and the perplexed individual helps himself at this point—in his feeling of freedom—with many effective or even ineffective weapons supplied him by nature; or he seeks his defense in flight, in concealment, in denial (ignoring) in death or in the pharmacopœia, that is, in narcotic means (alcohol and so forth), which, as experience shows, can allay the struggle with the secretions poured into the blood.

The behavior of the individual is the expression of the reactions produced through the psychic or bodily insult, that is the reaction of the central nervous system to the real or delusional outrages. The emotions (affects) released thereby cause, in my opinion, an increase or an arrest of the inner secretions (adrenalin? thyreoglobulin? [Oswald], etc.); they even create perhaps other "conflict ferments," from which result all possible further consequences for the health.

The psychic reaction, where there is menace or violation of the more vital personal interests, may, in healthy persons, and regularly does, assume manifold forms. Sometimes it assumes the character of a direct counter-attack, or of an impassionate preparation for such (subconscious latent phase), sometimes it consists in ignoring or in a passive opposition, that is, a true "inhibition" (defense against a surprise attack?), or in flight, evasion, hiding, eventually in wishes to disappear from the picture, or in malingering, the last of which conceals in itself a "retrospective wish in relation to facts."

In my experience, either the contestant takes up the conflict, or else he restricts his response to the more passive principles of defense (even to self-control), according to his momentary capacity for resistance, character, always according to the nature of the released affect, and also according to his comprehension of the situation at *the time. The intellect also serves the defensive and protective emotions here and their respective defensive actions.*

All the forms of protection and defense just now depicted we meet in the neurotic if he receives a psychic trauma, that is, he controls himself according to his education, emotional condition, and character, either through active return of the insult, or—and this is an especially frequently appearing phenomenon—he seeks to flee or postpones the defense—and controls himself silently—disguises his feelings, or lies. Through this control, the emotional tension created by the insult (anger, revolt, hate, pain, disgust, and so forth) is not usually lost; it becomes only latent, and disposed of otherwise (according to Freud, it is "repressed"; a conception which is not always applicable). The emotional tension presses in secret towards a discharge whereby—without control through reflection—it is projected in various emotional spheres and indeed to the very so-called substratum of the emotion. Henceforth it exercises a harmful, regressive influence even over the inner secretions (patient is "poisoned"). This is besides a physiological factor, which contributes much towards the building of "emotionally toned" complexes. The distribution of the processes of excitement corresponding to the heightened affects comes to pass in seemingly unaccustomed ways which are not under the control of consciousness—it is a question of an instinctive elaboration—mainly in the subconscious. The prevented discharge of the emotional tensions leads to various disorders both of the psychic and of the bodily equilibrium (disturbed "health"). This displacement (transplantation of the stimulus into an unaccustomed, seemingly foreign innervation sphere, and defense on the part of psyche, the "conversion" of Freud, may result:

(a) In the periphery, that is, in the somatic sense, as well in the sphere of the visceral as of the cerebrospinal central nervous system, and indeed (under a certain election still incomprehensible to us) in very definite, occasionally spatially sharply limited, if also not anatomically outlined bodily parts and apparatus, which are of significance for the indirect or direct maintenance of, or the economy of, life (hysteria).

These "displacements into bodily organs" are sometimes direct consequences, in my opinion, of the naturally resulting, acute storing up, in every strong affective process, of the inner secretions (overflow of adrenalin, thyreoglobulin(?) or ferments still unknown to us). Whether one can perceive here a protective contrivance, I cannot decide, but it seems not impossible. The somatic disorders can relate to:

1. The circulation and heart action, respiration (the oldest and most vital activities maintaining life): tachycardia, extrasystole, vasomotor, tension, tachypnea, and so forth.

2. The organs of digestion (symptoms: diarrhea, vomiting, nausea, that is, impulse to eliminate the undesired material through the digestive tract), dyspepsia, obstipation, and so on.

3. The sexual and urino-genital organs (heightened or retained secretion and plethora of the genital glands, frigidity, or heightened desire, the retention of the urine, and so on).

About each one of these three visceral spheres a whole complex of dysesthesias (including Head's zones) and temporary repression of functions of all kinds (symptoms of hyperactivity and of paralysis) can be grouped. The various kinds of neurosis can be divided very well in this way: neurosis of the heart, nervous dyspepsia, that is, neurosis of the stomach, and sexual neurasthenia.

However, repressions of innervation can appear in very similar manner within the cerebrospinal nervous system, the orientation system (that is, in connection with repression of the inner secretions and of an even psychic modification corresponding thereto). These disturbances may carry either the character of the excitation or of the paralysis (inhibition), that is, the so-called hysterical appearances of excitation and paralysis, which can carry a narrowly localized character (limited to very definite bodily parts; often to one side), and which can imitate all possible forms of organically produced, localized disturbances (even to convulsion and hemiplegia, monoplegia, paraplegia, and so on). They are definitely distinguished, nevertheless, from the organic disturbances, as much through the character of the "dissolution of the function" as through the nature of their onset. The more definite anatomical points of attack for the spatial hysterical stimulus and paralysis symptoms are unknown to us, just as is the nature of the sources of pathophysiological stimuli now in question (intoxication, electric, chemical or "mnemic" stimuli?), and whose closer study is beset by the greatest difficulties. One speaks of this in a clinical way usually of "psychogenic" forms of excitation and inhibition, whereby one seeks to characterize, nevertheless, only their source, in contrast to the roughly localized pathological-anatomical forms of functioning.

(b) Projection in the obscure world of the instincts, and in the subjective causality misled through the insult, that is, projection in the so-called instinctive thought (unconscious reflexion). Anatomically represented, this flooding with abnormal stimuli, especially with mnemic stimuli of many kinds and grades of development (experience and episodes from various periods in the past with their wider consequences) affects the cortex exclusively. This disturbance of equilibrium (now of a retarding, now of an irritative nature) represents a truly protean picture of disordered, uncoördinated structures, even to the phantasms in confused conditions, and to delirium with eclipse of reality, and the apparent subversion of all logic. Here, first of all, belong the hysterical confusion and dream states. In these one often encounters mad activity of the instincts with corresponding excited modes of expression and with " passionate attitudes "; the activities exhibit here a very great variety of character (grande hystérie).

Of course the whole process here has the character of a defense, though it may be ineffectual or without plan, of the wish for liberation from the psychic condition insufferable to the individual (pain, anxiety, and so forth), thus of a kind of psychic expulsion.

Anxiety and the accompanying compulsive conditions constitute a well-known main type of these acute or intermittent conditions appearing in attacks: *phobias* (anxiety neuroses). I regard it as unquestionable that here again the inner secretions or the acutely altered blood composition play a part in these disturbances, and that it is not a question here merely of fixation, of " converted thought."

(c) Displacement or transference in the logically built up subjective causality, in so-called reflexion. Every strong acute insult—no matter whether somatic or psychic in nature—not only raises the affect to a certain intensity, but controls simultaneously (automatically) the subjective causality, that is, the inquiry for the cause. For every man, after he has apprehended the insulting stimuli spatially and temporally, the first question is: Where does it have its own source; what has brought it about (causality)? and the second: When and how can it be removed in the swiftest way (defense); what does it forbode for the future, especially with reference to the further prosperity of the personality suffering? The direction of thought just now indicated can, under pathological relations, set in directly as a " form of a convulsion "; it can return and periodically recur (perseveration of a narrowly limited intellectual circle). In this category brooding belongs primarily, built up, as it is, in external, logical form, but characterized by " egocentric " moments, and accompanied by obscure instincts. It is a meditation on the relation of cause and effect in regard to the stimulus or occurrence, as well as over the means to protect one's self from similar undesired experiences, and eventually from wider (secondary) consequences of them; that is, to ward off or to free one's self from present difficulties.

Hereupon perplexity falls upon the patient; there arise all possible painful conjectures, misgivings, apprehensions, and so on, which may take the form of perseveration. The strangest, often most unsuitable means are instinctively chosen for defence often because of their relationship to earlier, impressive experiences. This form is regarded as real melancholy brooding.

Every neurosis erects itself on the three forms of "elaboration" (of highly affectively toned experience either not discharged or not satisfied) described in the preceding, and the elements of such "reaction modes" (forms of projection), alone or mingled with others, are encountered also in the majority of the psychoses. From first to last these are defensive and protective reactions for securing positions of safety (mostly proceeding from false hypotheses), or finally of preventive attacks and enterprises.

To understand better the mode of functioning of the various experiences and occurrences menacing our emotional world, we take as our starting point a mature, sound man, who lives and works in general with a vigorous surplus of joy in life. Illusion (in the sense of daily life), that is, confident hope in the fulfillment of daily, reasonable wishes, builds an essential share in this "surplus" (basic mood). Among these are to be included even further aims and problems which we have hidden in our lives. In the "illusion" it is a question of an optimistic belief, of a firm confidence that we shall reap the success that we have aimed at in some direction or in some form. Illusion is anticipation accompanied by a pleasantly expectant emotion of gifts from the future. Its opposite takes the form of disillusion, fear of failure, apprehension and gloomy foreboding (pessimism). Rob man of his illusions and he becomes sick! Life becomes insufferable to him unless the capacity remains with him to conjure up retrospective illusion, that is, ideal memories of a time long since past. Destruction of the illusion through bitter reality is disappointment: unfulfilled wishes, or those fulfilled in the opposite sense, especially such in the sexual sphere or in that of personal success (violation of honor, of vanity), put our emotional attitude to a severe test.*

Destruction of illusion, wishes, desires, especially in the sexual sphere, or discharge of such in a way contrary to the primary instincts, or cultivation of a forbidden secret "twilight life," with thereby an inevitable release of a secret passion with consequent disappointments (for instance, some passive or active sexual relations side by side, with their sweet but only briefly enduring secrecy, with their deceptions and later shame, and so forth)—all these lead, as shown by experience, especially in natures of deeply ethical or religious trend, to deep, long continuing collisions and to conditions of depression. Every single painful experience in this sphere (every "act" in such a drama) can eventually be of vital significance for the future life, for the wider development and fate of the individual; at any rate, every single insult to our instinctive life endures to a considerable extent, even if it is conquered provisionally, in the latent state; the conflict still glows under the ashes, and can become the point of origin for new collisions, whenever a new, acutely serious experience of related form appears. In the brain tissue the "complex" exists latently to a great extent, together with the stimuli of a visceral nature once accompanying the passionate outbreak.

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* On this matter of "illusion" see Jelliffe and Brink, Ibsen's "Wild Duck." *Psychoanalytic Review,* January, 1920. [Translators' note.]

The visceral phenomena can break out intermittently either of themselves or in connection with the ideas connected with the experience, and also with subjective causality taking false directions (removal to remote moments unconnected with the phenomena), and can prepare new suffering and new anxieties for the individual to whom the true connection between his somatic troubles and the experience is hidden, and who frequently cannot longer remember spontaneously the details of the experience ("defensive amnesia"). Freud has made many important observations in this sphere. Bleuler and his pupils have studied these phenomena further, and have termed the slumbering residue of such experiences, emotionally toned complexes. If a suitable "abreaction" does not take place, then, according to Freud, a "conversion" into somatic disorders takes place. These observations, in their broader application, have led to the theory of "psychoanalysis" with its complicated symbolism (Jung, Ricklin), opposed on various grounds, which is known to us all. Veraguth has pointed out to us that "complexes" of various types and sources, among others, through the so-called "psychogalvanic phenomena," can be brought objectively to demonstration, a fact the authority of which one cannot doubt. All these things gave rise years ago to much discussion in our society!

Unsolved, affectively toned complexes, leading back to a series of definite experiences, especially those of a sexual nature, which slumber in the depths of the soul, in individuals (generally, indeed, "deviates") disposed thereto (especially the feminine sex), often lead to *phobia,* to hysteria, or else finally to "neurasthenia," as shown by experience. This fact I can confirm without further discussion.

The connection between the factors just now mentioned I would like to clarify biologically. Three things are to be noted in the psychopathology of such conditions:

1. *The factor of forgetting.* Of course it is not a question of a total exclusion of the disturbing memory from consciousness, but only of the incapacity of the patient to think of it spontaneously, that is, on inquiry, to remember it, although great psychic injury had once produced it in him (see Bleuler, Freud, Frank, Jung, and others). Such "forgetting," in my opinion, might be considered biologically, perhaps, as a means of defense against offensive perceptions and things. One wishes that he had not lived through it; one might thrust them away—ignore them. This defensive apparatus functions often automatically and very promptly; even under physiological conditions it comes into activity before the individual has formed the resolution to remain ignorant! The central nervous system eliminates the most harmful factors, and there follows an inhibition of the spontaneously associative ekphorie. The provisional defense has taken place.

The question now follows: Is the whole harmful phenomenon done away with, thrust back, made harmless through forgetting, even in the visceral, or the sympathetic system, even to the inner secretions (which, however, had already produced their chemical affects)?

No! there often occurs only a "slackening" as respects the cortical structures in question, that is, between anatomical basis of the thought processes and the elements (nerve cells, fibrillar bundles, molecular substance?) governing the inner secretions (innervation of the endocrine glands through mnemic stimuli). These last, once "flooded" or "overladen" ("affectively toned experience") can become a latent, that is, mnemic source of stimulation, and many a "psychic" ("logically" connected) form of excitement can be brought under that jurisdiction. In the latent state such forms of excitement might now allow a relatively independent existence, less comfortable to the bearer of it. They are generally labile, that is, always ready, to break forth from their concealment, perhaps in a suitable allusion (word, symbol), and in violent manner to exert their influence in various peripheral, visceral innervation spheres: the patient suddenly blushes or bursts into tears; his heart palpitates, and whenever the affect-laden, slumbering "complex" is touched in any way. Often the eruption is clearly "fermentative," as in the burning out of a powder fuse. This visceral function can be connected with thyroid glands (vagus system), to the adrenals and the chromaffine bodies (sympathetic system), but also to the sexual glands, the hypophysis, epiphysis, which are connected directly with the brain substance through the lymph spaces and fibrillar bands (Edinger). The related secretions bathe, indeed, all parts of the cortex and even deeper lying parts of the nervous system (through mediation of the blood or of the cerebrospinal fluid; after filtration in the choroid plexus?), whereby in an affective outbreak various even somatic phenomena can be brought to light: glycosuria, heightened bile secretion, heightened heart action, pupil dilatation, blushing, exophthalmos, diarrhoea, vomiting, localized pains, and so on (attacks). Anxiety is above all the initial symptom (reactive excitement as to some danger believed to be imminent). The anxiety attack bears unmistakable signs of a true intoxication (products of inner secretion still unknown to us). Biologically the anxiety presents a suddenly aroused conflict to preserve the immediate existence (in the idea of the patient attacked). It is characteristic here that the activities which physiologically are most important for the patient seem directly attacked, even if only in the delusion of the patient: heart action and respiration. The emotion that the heart is standing still forces its way in, a stroke or some other evil or catastrophe is imminent, and so on, recedes from consciousness; the patient feels an intolerable load on his breast, cannot breathe; pallor, bursting out of perspiration, a jumping pulse, set in; the pupils expand; exhaustion ensues. The patient feels exhausted, irretrievably lost, and struggles for the preservation of life for that very moment, though in reality his life is in no danger. Restless torment seizes the patient; he longs passionately for release in any form, only not through death. A few minutes, and all is past, but exhaustion and intense fear of a return of the attack remain. We know that such conditions are but the daily bread of neurologists.

Every attack of this sort finds explanation in the ideational current of the patient, namely, that the patient usually clings to the most closely related fact or to related experiences of the remote past. The whole subjective causality straightway becomes mobilized with compulsion, to stress this once more; strange causal relations are invented and are firmly adhered to. The most false causality belongs necessarily to the attack! The patient is convinced that a localized bodily illness resides within him (the heart, digestive apparatus, sexual organs, or other organs are affected), or else "overwork" is the cause of the anxiety. Later still other more remote motives, such as death or sickness of relatives, are drawn into the explanation, or bad air in the room at the time of the attack, digestive trouble, in short, all except only the "complex" itself. This misleading subjective causality may become later the basis for secondary symptoms. Many somatic and psychic troubles, even the search for an explanation fitting the attack, are fixated or arise periodically, generally as compulsions.

Thus phobia develops on the foundation just now sketched. Phobia is a condition in which negative illusions (fear of something unexpected, evil) exert their deceptive influence with regard to the past and the future, that is, retrospectively and prospectively carried on, under the restraint of correcting conceptions (true instinctive obscure thought, impelled by the " complex "), and all this in spite of the formerly existing logical sequence and intact nature of thought. Speedy release and care for the most important life interests, which follow his emotions in danger, form the focus for the thought of the patient. Eventually a disconsolate emotion takes possession of him, of having barely escaped an immediate, great danger or painful situation; in my opinion he becomes the victim of retrospective meditations: what immense evil could have come to pass, if the danger had not been removed in time (for instance, to have been crushed by driving), and what great danger may not await him? Such thoughts, that is, the inner retrospective examination of an imminent peril, and the possibility of a return of such in the near future, is always reproduced anew compulsively, and they conceive anew a fear of fear, unless some rescuing voice brings the true relationship of things into the ideational sphere of the patient, whereby at least a temporary discharge of the torturing tension is brought about.

Phobia constitutes a chronic latent condition of great lability. It is released periodically through mnemic stimuli (symbols, allusions, and the like), and is characterized by short or protracted attacks. According to the innervation region in which the mnemic stimuli is " projected " (periphery, instincts, causality), and according to the reaction on the part of the individual, we encounter differences in form, that is, differences in symptom complexes, which betray a mode of reaction in keeping with the form of reaction to which the individual is disposed.

Form 1. The immediate life (respiration, heart action, and so forth) appears in the eyes of the patient to be menaced, perhaps only under certain conditions will come to pass, if he undertakes this or that, or if he forbears doing this or that. He cannot set foot on a wide square, go alone on the street, go past certain houses, and so forth, else something undefined but evil may confront him (agoraphobia). In one case a patient is driven from within to leave a meeting hall filled with people, to flee; even the idea of visiting such a place without protection awakens anxiety within him. In another case, if he has touched a suspicious object he is tortured with the idea of having infected himself, of being the carrier of a dangerous disease (delusions of touch). The reaction in all is: away, flee, home, or wash, in short, a blind grasping for protective devices of all kinds. The patient plunges out, cannot be alone, the impulse leads again to perseveration (compulsive persistence), sound reflection is checked, crushed out (holding fast to the physician, to certain objects, and so on). In the latent state the patient avoids or goes around certain places, where a surprise attack, sexual violation, could menace him. His motto is: evade a possible danger or disagreeable situation at all costs (even fear of such a fear).

Form 2. The anxiety is in the same form as above, but the patient does not flee; he does not even resist the situation; on the contrary, he remains passive; he remains silent and does not stir (inhibition). The conflict is active in the innermost circle of the instincts. Through the passivity (for instance, playing dead; even feigning death in animals), the individual seeks to guard himself from a "surprise attack," or he continues to cling to introspection. The patient, then, is held fast upon the spot where he happens to be; he cannot arrive at a resolution, cannot arouse himself energetically to his usual manual work, for instance, to dress or to undress. However, the visceral nervous system works at full pressure (tachypnea, tachycardia, dilated pupils, pale face, finally body excretions). This catatonic condition in schizophrenia, accompanied frequently by hallucinations or delusions, can give way in the various phobias after a few minutes, or after a longer time; there is a remission, and the attack threatens to return, until medical help is at hand.

Form 3. The character of the attack is changed (fear of the attack, which is postponed); it is a question of a latent, but continued labile condition with variations or remissions. Here, however, projection of the mnemic stimuli (of the "complex") takes place in the "world of instinctive reflection," but with greater opposition of logic, because the affect is no longer in an acute state. The means of defense against the threatening danger (this lies more in the future, in the eyes of the patient, and is dependent on special contents of thought) constantly occupy the patient; the most unlikely and most remote motives are often involved in the explanation, and the "reason" apparently "descends from Heaven."

The instinctive, logically loose reflection over the suitability of the means of defense chosen is released with compulsory force, but here the patient is entirely conscious of the compulsion and of his foolish conjectures; but he is defenseless against them. One suffering from the "maladie de toucher," that is, the fear of touching, cannot keep away from the washbasin; a hundred times a day, indeed, he must wash his hands. If he is prevented forcibly from doing so, or if he controls himself (and he can), then an acute anxiety attack with all its " visceral " consequences may break out. Others surpass themselves in devising means of safety (repeated looking about to see if someone is under the bed, whether the door is actually locked, seeking to save one's self by a sudden step), and so on.

Form 4. Again here it is a question of a labile latent state of anxiety, which bears intermittently the character of torture. Here the situation rules the " fear of fear." The projection of the abnormal mnemic stimulus (affectively toned experience in the remote past, which is held only darkly in the memory) takes place in logically more vigorously grounded ways in the sphere of subjective causality. In this form the patient falls victim to a real " metaphysical mania." Under repetition compulsion the most various and apparently indifferent things (apparently furthest removed from the psychic trauma) are thought of as possible causes and effects. A true " causality delirium " or mania for questioning takes place (with painful care for all eventualities). The patient can indeed give a correct answer to himself; indeed, the answer appears to him as superfluous and as foolish as the question; but notwithstanding this he can never calm himself. Why has a chair four legs and not three? What would be the consequences if his healthy child had been born a monster? Why must we eat? And so on. Other questions apply to very definite delicate experiences, or have close analogy with them; thus it is perhaps a question of perils threatening the patient in his environment because of indiscreet assertions; or the questions pertain to inner psychic conflicts (of a nature important for preserving life, sexual, social, religious) with unsatisfactory or stored up discharge (feeling of sin and anxiety). One of my patients under compulsion had to blaspheme against God in thought to defend himself from an anxiety attack, and helped himself against this means of defense, which seemed absurd and unagreeable to himself, at times in equally foolish ways, although with temporary success, if he applied the respective blaspheming words in thought to all his acquaintances, so that God, the father, would be eliminated from the conflict.

Form 5. These are compulsory ideas or emotions based on certain definite experiences, and struggling towards a discharge through activity. They are deeply, affectively toned, and the latent anxiety is here conditioned or dependent on special stipulations; it does not devolve upon the immediate present, but refers to the past or the remote future: the patient might shriek out loud in church or other public locality a sexual secret very painful to him, or compromise himself in other ways, and so on. Or: in what evil condition might he not have fallen years ago if a small incident had not saved him at the last instant.

Here the typical feature is the compulsive causality, turning over monotonously on a possible conflict, and usually weak in its logical structure. The conflict, to accent this once more, is comparable to a convulsion in the motor sphere. And for removing the conflict the most peculiar psychic means are chosen (charm, symbol, speech, and so on), according to the nature and education of the patient.

I will now leave the interesting subject of Phobia, which still needs much elucidation, and devote a few words to Hysteria, that well known psychoneurosis, in which the unreleased emotional conflicts, heaped one upon another, are brought into a latent state, and injure principally the "world of sensation and motion," that is, the world of ideas, and thereby, of course, they injure those corticosomatic functions (essentially temporal), which above all evoke active and inhibitive stimuli, whereby they produce symptoms on the part of the visceral nervous system similar to those in other neuroses. But here, also, this comes to pass without especially injuring the real "intellect" and thought. In hysteria it is a question of course of psychogenically produced phenomena of paralysis or excitement, through mediate or immediate influences on the life of the soul, which are often definitely bounded off specially, and may affect any part of the nervous system. These stimuli are easily demonstrable even objectively. They resemble organic disorders in manifold directions: paraplegia, monoplegia, hemiplegia, abasia, amaurosis, hemianesthesia, and so on; and even severe disorders of the secretions—vomiting, diarrhoea—(secretion of saliva and perspiration) appear.

How can such severe "functional" disorders, where the "soul" ("psychic" forms of stimulation, "mnemic-irritative") interferes in a relatively rough, inhibiting, or irritating way with the tectonically delicately organized brain structure, be explained physiologically and biologically on the basis of our present day knowledge? We must remember in this connection that what we call "soul," biologically is a living structure within us, coming into existence out of the various biophysical and biochemical processes that have occurred in endless complicated developmental phases, and therefore taking the form of innumerable "temporal layers." The soul is a collective concept, which presents itself to its possessor in a form wholly different from its biological structure. For this form we have as yet found no appropriate method of physiological investigation or approach. In my opinion the psyche is comprehensible only "historically," that is, genetically, and only as a continued series of complicated reciprocal actions (even various reciprocal "inhibitions") between the outer world and the world within us, and when the inner secretions are duly taken into consideration.

In organic paralysis (for instance, hemiplegia) a severing of continuity in the great motor area (inner capsule, tegmentum, pyramids) is assumed as a direct anatomical fact. The initial flaccid hemiplegia constitutes not only the result of a severing of anatomical continuity; it presents rather a combination between the indispensable necessary motor results of a lesion of the corticospinal path (residual hemiplegia) and of a functionally caused false distribution of innumerable other impulses participating in the construction of the bodily movements: dynamic components. The anatomical basis for this is composed of structures widely separated from each other but connected with the lesion by means of medullary fibers. A process here seems to take place which presents resemblance to shock and which I have called "diaschisis" (corticospinal and associative diaschisis).

In this situation, injury to the circulation in various cortical and other areas, and also the pathological process, etc., play an important part. The gross anatomical components, the "skeleton" of the residual hemiplegic symptom complexes, especially the typical spinal symptoms of disintegration (change in the various reflexes of the extremities: the Babinski phenomena of the toes, the "cumulative retraction reflex," and various other synkinesias, etc.), are missing almost without exception in hysterical hemiplegia, while many other initial-hemiplegic symptoms (hypotonia with limp, dragging of the leg, significant motor weakness, and so on) stand impressively in the foreground.

For the elucidation of the pathological neuromechanics in hysterical hemiplegia, we must consider primarily the innervation weakness, and then the dynamic moment (false distribution of the corticospinal impulse), since gross anatomical disintegration of the motor components is missing. It is a dynamic disorder, which is closely related to a diaschisis, but for which other anatomical points of attack must serve as a basis entirely. Here not only the circulation of the blood but also the injurious influence of certain chemical combinations in the blood may play a rôle: both factors just now mentioned—we cannot avoid this conclusion—must exert an unfavorable influence on well-defined anatomical connections of the central nervous system (projection and association components) from a certain level of cerebrospinal tectonic anatomic development on. Very definite cellular elements and structures must become refractory for the spontaneous (intracortical) stimulation. Or else certain levels in the cortex may be unstimulated, but which enter upon the scene before spontaneous motor impulses; levels, that is to say, which serve as the basis for the successive development of unilateral movement, the exact localization of which cannot be more definitely determined at the present time. These are apparatuses distributed according to historical development and built up according to definite temporal principles (inhibition of the motor impulses involved).

If we adhere to the picture of a faulty distribution of the will impulse and relative " instinct stimuli " in the cortex, we might then conceive that through the psychically produced collision of the various forms of stimuli, on the one hand, an excessive burden with latent forms of stimuli in the sphere of the life of the instincts (a chemical form of diaschisis?; defense reaction, conflict on the part of self-preservation against foreign intruders), and on the other hand, excessive inhibition up to total immobility in the successive, rhythmically ordered development of the muscular mobilization, takes place. The last might perhaps be conceivable in the form of an overthrow of the successive rhythmically built up discharge: a transformation of acts otherwise following one another into a simultaneous discharge produced by summation or perhaps in such a way that the natural tectonic-anatomical points of attack for the stimuli would no longer respond. The further phenomena in relation to the innervation of the extremities then would be of secondary nature (results of faulty regulation), and they would be of a very similar kind as in cerebrospinal diaschisis. In other words, even in the secretions, a loosening of contact along the whole line, even to spinal reflexes, would break out, a loosening of contact which nevertheless leaves a certain room for combined cortical and subcortical reflexes to play. In a morphological and general physiological sense, one might be inclined to assume interruptions between the stations for the mnemic motor impulse and the cortical innervation points, for the realization of the movements (cortico-associative system of electrically excitable foci). Herein an involvement of the chemism regulated through the inner secretion (even in the cerebrospinal fluid?) would not be excluded, although this would not explain the one-sided innervation injury nor the localization.

This question arises therefore: in hysteria—where it is a question of an injury to the total innervation—why, as soon as the bodily parts are concerned, are only *very definite,* spatially outlined bodily segments and sensory spheres chosen, and why do all the rest remain free? How does the election with regard to certain peripherally sharply outlined innervation spheres take place as result of a general injury? In one individual we find, as is well known, amauroses as the result of a psychic trauma; in another, hemianesthesia; in a third, paraplegia; in a fourth, ischuria or mutism, and so on. One usually connects these elections with the special content of the single or several "complexes," with definite conscious or unconscious "overdetermined" ideas or images, and seeks to explain even the somatically localized hysterical symptoms on purely psychological grounds. But in my opinion the various somatically localized hysterical symptoms are much too gross for such a purely psychological explanation ("autosuggestion") to be satisfying. In many of the inhibition phenomena in question (hysterical paralysis), even biophysical and biochemical functioning moments must be called into play in parts of the cortex marked out in a rough way (perhaps corresponding to great projection fields or arterial areas in the cortex). These moments we can designate provisionally in no way except as "psychic shocks," produced by summation. This may be separated from the more anatomically considered diaschisis (separation according to fibrillar components in the surface of the fracture) only in the sense that in the latter case, the points of attack or injury are defined through *anatomical* course in the foci of interrupted bundles and fibers; in psychic shock, on the contrary, they usually spring from components of stimulation usually built up according to a temporal plan and not sharply differentiated anatomically (injury in paths of innervation elaborated and adapted physiologically and biologically).

One might think of other apparatuses involved in this choice—aside from the autotoxic and vasomotor components—apparatuses which already at the time of illness had been organically weakened. Or one might consider the stations of innervation which were less resistant in consequence of deficient exercise and training.

Here we approach a new issue which is of cardinal importance, especially for the comprehension of spastic and paralyzing hysterical conditions, namely, the problem concerning the importance of the struggle for vital interests in question, concerning the arrangement of the various " innervation layers " which, as they do not admit of being more closely determined spatially, must be considered more chronologically, in the light of the genetic succession of the various nervous performances. Here we must proceed from the view that in every conflict concerning the importance of a physiological act or activity, that is, its " birth," the central apparatus serving for the preservation of immediate life, then those serving for the " defense " of the separate bodily parts and organs, other things being equal, are not only ontogenetically and phylogenetically oldest, but they are by nature by far the best adapted to resist external insults. These apparatuses are: circulation, respiration and the defensive reflexes as well as those for preserving equilibrium of the body. The apparatus for orientation, sensory perception, for preserving the upright position, and indeed for the intended movements as well as for gestures are acquired much later, and are scattered. Notwithstanding several well defined cortical " centers," they are as far as their functioning is concerned, assigned to innervation acts, which are very complicated in their temporal construction, and dependent on reciprocal influences. At any rate their function may be destroyed from many directions, and in a relatively easy manner, both directly and indirectly (sopor, coma, stupor). They may be injured more easily and more profoundly than the primal apparatuses. This to a much greater degree is true for those innervation spheres (fibrillar bands, molecular substance, the satellite and the granular cells), which in the child are built up later and more delicately, and the activities of which necessitate a well organized and constantly more delicate relationship between the various phases of psychic development. They remain capable of performances only if the historically developed psychic structure (succession continuity of the important personal experiences, that is, the temporal orientation and the results proceeding from them) is not essentially disturbed, and if the inner secretions function correctly.

Within these last processes and forms of stimulation, there are found both in the intellectual sphere and in that of morality, activities of a still higher character (religious, artistic endeavors and needs, virtues, duties, and so on), which win the victory in the competitive struggle with inferior motives and instincts, and can continue in their hard-earned higher level, only if they are continually exercised, and constantly strengthened through new experience—often at the expense of the lower instincts. These highest psychic activities, now, are especially easily injured through acute psychic shocks or experiences of many kinds, and also through pathological (infectious) processes in the cortex, as well as through endogenous and exogenous poisons and they are the more easily injured in proportion as they belong to later developmental periods or levels in the child and in proportion as they presuppose more complicated physiological conditions as their foundation. Often, failure or difficulty in functioning in this or that nervous, or psychic sphere has been dependent not in small measure upon the order of the morphological and biological developments of the apparatus in question. Moreover, individual tendency, discipline, and education, and, too, the significance of the activity for the life and success of the individual as a whole, play an important rôle. And in my opinion, combined mnemic factors of stimulation, similar to those built up through the individual development and education—together with their interest values—deposited in temporal strata (among others, those brought together for us step by step through school) can disappear also " in layers " or step by step —or indeed becoming inhibited, as it were, or disintegrated, according to the " educational phases."

We come now to the question: How can we explain that in phobia and also in hysteria, the insults, for example in the sphere of sexual life, produce *bodily symptoms* (among others, in nervous attacks) in *entirely other visceral* innervation spheres, that is, not within the injured sexual functions, but within the uninjured functions important for life; thus for instance, cardiac, respiratory, digestive symptoms (abnormal heart action, feelings of anxiety, difficulty in swallowing, dyspepsia)? Does the process of *displacement* always follow certain (perhaps affect toned) ideas, certain symbols, or is the way determined rather by physiological (organization of the visceral innervation) or even anatomical causes (tectonic structure, vascular supply?)? From a wholly physiological viewpoint one would think, that for instance the sudden, disagreeable discovery of the impotence of the husband, or of his faithlessness would produce in the wife sensations and other difficulties within the sexual sphere (for instance, vaginal spasms, ovarian and sacral pains, and so on) but not an arrhythmic heart, tachypnea vomiting, feelings of anxiety, vasomotor disturbances, and so on; although in concrete cases it might not be difficult to find a connection between the trauma and the bodily disturbances by way of the play of thought and symbols; and this without proceeding arbitrarily in the interpretation.

Now from the physiological-anatomical viewpoint, one must remember that really all visceral ganglia are connected more or less closely, that is, are related one to another, even in so far as their spatially closely outlined, cortical or subcortical representation is concerned; then too in the important reciprocal relations between the single glands (for instance, between the thyroid gland and the adrenals, the sexual glands and the chromaffine system, and so on). According to my experience a chemistry related to the inner secretion could represent the connecting link here. Considered more broadly it may be recalled, that for instance the vagus is responsible for the innervation of the thyroid as well as for that of the heart and of the digestive organs, and that inhibitions or stimuli in a peripheral innervation sphere of the oblongata, or higher upwards, can go out from a definite place to various areas. I do not assume here as the determining factor a true "conversion," a psychic repression of emotionally toned complexes in somatic effects (In Freud's sense). The "somatic" processes, which are exhibited in unresolved pathological conflicts, are coördinated (not subordinated) with the harmful experience, which has been temporarily carried over into the world of oblivion; in my opinion both phenomena present defense reactions biologically parallel and equal in value to one another only existing in different spheres.

And does pathological anatomy play no part in injuries to the world of emotion and morality? Of the pathological processes only inflammation, or infection accompanied by radical changes in the blood chemistry, and spreading diffusely in the cortex (for instance, meningitis), can produce profound changes in the emotional sphere (conditions of delirium, repression, exaltation). Poisons which cause continued disturbance in the inner secretions might produce similar results (for instance, Basedow's disease). But never, in my opinion, do emotional injuries spring up on a true morphological-anatomical basis, for instance as result of a hemorrhagic lesion or of other diffuse, gross changes in the cortex. The last have only dementia or disturbances of orientation as a consequence, not injuries in the sphere of emotion and affect. As is the case of underdevelopment or constitutional anomalies the majority of pathological processes in the cortex contribute to the pathology of the emotions only so far as they retract the natural discharge of emotionally toned conflicts (in the sense of psychic shocks) or as they produce a certain mental dulness.

I once read somewhere that grains of corn that were found in old Egyptian tombs, and that had lain hidden through thousands of years, when planted in fertile land, sprouted up, and produced ears of corn. The same thing happens mutatis mutandis to the emotional tensions (produced through strongly affect-laden experiences): stored in the human cortex, unreleased and long postponing their activity in an obscure latent state they can dwell there for years. From time to time they stir nevertheless (quickened by sympathetic associations), and cause even directly somatic disturbances in the startled host, especially if he is ignorant of their true relation with the incident experienced, and is surprised by allusions connected with the experience. That is to say, such inveterate psychic " tensions " (" complexes "), if touched by the right " key " (conversation, hypnosis, association tests) and brought to ekphory through symbols, that is, suddenly freed from " their captivity " (Freud's repression), then break forth anew. The passionate emotion repressed into oblivion, suddenly released, is again set free—sometimes with its elementary force and accompanied with all its separate visceral and bodily symptoms, and after such expression the patient may feel relieved by the discharge which is satisfying, though it has been delayed. But the contrary can occur (in unskillful medical conversation), and the " complex " laden with still severer suffering, may recede anew into the latent state. Herein it is a matter of indifference whether the psychic wound was evoked through a sexual or other insult (affecting self-preservation, honor, and so forth, and whether it originated in the earliest childhood or at a later time. A main condition for its taking place, is, however, that the episode serving as a basis for the psychic trauma was repressed into the latent state by a defensive act, that is, by a defensive act (designedly?) was " forgotten," and that later the possibility to conquer the insult in the unconscious was denied the individual.

Our knowledge of the so-called emotionally toned complex, of their " repression " (Freud) into the unconscious, and of their discharge, we owe above all to the works of the school of the so-called psychoanalysts (Breuer and Freud, Bleuler, Jung, Adler, and others). Through innumerable specific observations I have been able to confirm the correctness of many of the clinical facts taken as a basis for the explanations of those authors. The observations and conclusions of these authors are exceedingly valuable biologically, even if I cannot, to speak plainly, accept all their explanations without further confirmation. They tell us:

1. That the affects or conflicts once released in connection with insults to our " most important life interests " regress into a consequent latent state in the central nervous system in the sense of unresolved " tensions," if they do not find a rational, that is, harmonic discharge (or if a suitable abreaction at the time of the experience does not take place). Notwithstanding that the patient often cannot remember spontaneously the experience in question and the accom-

panying moments; they remain unforgotten and undischarged. These "retentions" now often (even in well people) cause nervous, somatic disorders, which usually occupy the foreground of the patient's complaints, and

2. That stimulating conditions laden with severe emotions existing in the latent state, and ideas connected with them are still in the position after years—if they again come into actuality through associative paths—to set functioning once again the inner secretions, or, the visceral nerves, as they did in the past experience, that is, to permit the stimulation complexes involved to be set acutely "in motion," just as were the "old Egyptian grains of corn in a fertile field." There lives latent in the "complex," the "force" to become actual, to evoke the same "chemism" in our blood, or to change temporarily, while in the latent stadium the complex only had the power of causing uncontrollable discomfort and periodical manifestations in the form of "attacks." Perhaps the two systems— the sympathetic and the autonomic—even with reference to their higher representatives in the cortex, are antagonistic to one another ("representations in the latent stadium"). At any rate, many experiences confirm the view that there is a close relationship between the emotionally toned events and inner secretion, and it is very probable that there is a very considerable participation of biochemical factors in the production of emotions.

And now we must turn to the dissolution, that is to say to the acute (temporary), and to the progressive "liquidation," of morality.

CHAPTER VII

Dissolution and Resolution of Morality

Of course one can speak of catabolism only where there is, or once was anabolism. This expression is borrowed from chemistry, where the molecule passing through various processes, now breaks up and now again is built up anew. In biology (physiology, pathology) the expression " Dissolution " has not yet met with definite acceptance; but in my opinion it is not a poor choice, and might with advantage find application even in the discussion of the sphere of emotion and morality, where—in the " somatic " components—chemistry certainly plays a prominent rôle.

The terms " construction " and " destruction " may be used in various senses in biology: for instance, in that of biochemistry and biophysics, but also in the morphological sense. And one must have regard in both of these senses for the fact that in life processes there is a constant construction and destruction (as for instance in digestion and assimilation), but also too a construction and destruction of more stable values (furnished through long periods), which physiologically split up into subordinated factors, and these on the other hand can also be enriched by higher ones. Finally we come to a destruction where there is often no reconstruction: in acute and chronic, primary and secondary degeneration in the nervous system (necrosis or atrophy of fibers and of neuron elements). Through such destruction the nervous function becomes weaker; is perhaps mutilated and finally suspended. Indeed we can suppose an analogous " destruction " in the psychic sphere; that is to say: the acute or successively progressive loss of orientation, intellectual or moral aberration, and finally dementia.

We might expect that the more complex the construction of a function is, the more layers it is composed of, the more various the forms of the destruction and the greater the number of fragments and loosened foundation stones. The groundwork and foundation in the realm of emotion and morality are without doubt based on the primary instincts, that is, the instincts which have once created the functions most important for life, and have accompanied them without interruption; that is, the instincts important for life: air and food hunger. These indeed could not be further decomposed.

What is decomposed in the realm of emotion are values which through culture and education are built up on fundamental instincts, through the mediation of countless ideas, being assimilated from these ideas. These are especially: greater regard for posterity, for the family, for comrades (fatherland), then for the community ("the inalienable rights and duties of mankind"), and finally for the welfare of the whole cosmos, especially for man as such (humanity).

The tendencies just now sketched create the final goal of the germinal impulse towards perfection dwelling within every living creature, even within the human egg cell. The new emotional values built up during the phylogenetic and ontogenetic development, and in the closest relationship to the world of experience (a long, exceedingly delicately graduated register) hold their own against the primary emotions, and continually conflict with them. And the so-called psychic calm joy in life, contentment, happiness, represent a favorable balance with reference to "possession," in the distribution of the various forces here in question.

The primary emotions and impulses, as for instance, desire, love, hate, pain, aversion, the impelling will, as we have already pointed out, permit of no further destruction, at least biologically and psychologically. They constitute roots and stem of the whole emotional life, and as we have indicated must be ascribed even to the living protoplasm—to be sure, only germinally. Virtues and vices, on the contrary, the successively acquired egoistic and altruistic impulses, and the emotions derived from experience, that is, from stimulation of a corresponding latent state, which become manifest in the immediate present: compassion, enthusiasm, feeling of duty—to name only a few—can be decomposed, (perhaps only temporarily), that is, diminished, inhibited, repressed, annihilated, and indeed without harm to the accompanying ideas; and these impulses in connection with other relations be supplied with richer deposits and sprouts —that is refined; and both these processes take place in connection with numerous emotionally toned experiences, each such experience releasing in us a conflict with the primitive instinct and putting our "character" to test just as is the case through poisoning (alcohol and so forth), under influence of disease producing substances, and the like. Biochemically such a destruction perhaps may be considered as a competitive conflict between the autonomic and the sympathetic nervous systems (influence on the blood and in the cortex) on the one hand, and between the various "derivatives" from the activities of these two visceral systems, on the other. This is a conflict, the decision of which lies in part in the force and functional strength of the accompanying ideas earned through education (reason). The assumption just now expressed as regards the sympathetic and autonomic systems is supported by the antagonism of these two systems in the economy of everyday life. In the peripheral areas of the two systems the antagonism reaches expression as is well known even pharmacodynamically, and furthermore through the results obtained by experiments with the secretions (Pavloff).

Emotions and morality possess, as we have seen, a well characterized, genetic construction in which we can distinguish a series of phases closely connected with the immediate problems of actual age. In a roughly schematic way we might present, perhaps, the following "biological scale" for the emotions and morality:

1. First phase: capacity to keep the most important functions running, as well as to compensate for "tensions" arising in this connection (gratification of sexual and food hunger).

2. Capacity to protect one's self from attacks in the separate bodily parts or organs, to nourish and care for the body. The hunger for food is appeased by the acquisition of food, which is connected with locomotion. In short, the capacity to maintain one's self within the habitual circle.

3. Striving for the affection of another, childhood love; later the first love for the opposite sex emerging timidly, longing for comradeship, joy through a symbol, through muscular exertion and games. Impulse to be active in this direction.

4. Desire for work, for development of one's own abilities. Need of knowledge, education for vocation, imitation of activities, of those in higher positions, development of character.

5. Increased security, avoidance of danger, defense against foreign unjustified encroachments, desire for conflict, unfolding of more mature sexual emotions, winning affection of the opposite sex by showing admirable personal characteristics, defense of honor, choice of a vocation, formation of an aim in life.

6. Care for the family and posterity. Education of children, establishment and settling down, greater provision for social duties undertaken.

7. Greater interest in the welfare of the community, active participation in social problems, fulfilling duties towards the community and in service of the public, love of country, and devotion to patriotic interests.

8. Constantly increasing development of the comprehension of humanitarian activities, appreciation of the rights of others, even outside the boundaries of the fatherland. More earnest religious,

philosophical, humanistic tendencies and activities; active and passive activity in this direction.

9. Cultivation of a higher, altruistic nature, moments which determine the noble character and disposition of man: self-sacrifice, a strict sense of justice, modesty, wise self-control, judicious acts of charity, and so on. The highest human ideals.

These levels of emotion and morality, up to the well established personal character, grouped in a roughly schematic way (related to one another in many ways, and without following one another in invariable succession) are formed as they occur in the everyday life of man. They are indicated partially, also, even if only in a rough way or in embryo, even in the higher animals living in groups or herds (in part indeed even in insects: for example, ants). At any rate certain "collisions and conflicts" between the various emotional values are present already in them. The latter are similar to those already mentioned, are organized, and demand discharge. In youth the instinct of self-preservation dominates, in the more mature individual the sexual impulse and the instinct of acquisition, in old age, social and religious impulses, and the preservation of what is acquired in life (frugality sometimes reaching avarice).

There now arises the question of a definite, degenerative dissolution of the emotions (produced perhaps by chronic intoxication, for instance alcoholism, or through sickness, for example general paresis, dementia praecox, and so on); these emotions developed last in life and those depending on complicated education and discipline crumble away; and those characteristic of early youth (that is, emotions and impulses and appetites resisting harm of all kinds) now dominate the field. Frequently also the superfluity of "positive," healthy emotions (joy in life, and so forth) are injured, and the negative emotions (depression, bitterness, and so forth) win the upper hand; sometimes reaching the state of "chronic attitude of defense" against dangers that are mainly imaginary (persecutory ideas). In all chronic or progressive (infectious) diseases of the cortex (also in dementia praecox), there is an effort to thrust aside something standing in the way of the personal welfare of the individual, something "offending" to the emotional life, to make the attacks on the part of the outer world harmless, and so on, and this undermines every joy in life for the patient through a certain vicious circle (morose character).

Elementary self-preservation or "the chronic attitude of defense on the patient's part, against imaginary dangers"; this "latent war of independence" in one's own personal life constitutes from this point on the germ of the entire psychic life of the patient ("dissolution of the emotions"), while, on the other hand, the love for the other sex, or for the profession, the regard for others and, finally and most completely, interests in all social activities, undergo radical decrease, or go under in the struggle with the primary instincts. Doubtless the emotional life may be attacked or decomposed in a relatively independent manner, that is, without harm worth mentioning to the true intellect, to orientation, or memory (criminality, moral idiocy; for instance in microcephalic cases). In this connection too, the conditions in many cases of chronic alcoholism are characteristic. Here, as is well known, the intellect, in so far as a certain sociability in the form of superficial conversation such as is carried on in saloons is concerned, is not noticeably weakened, nor are the sexual life, business, the every-day duties; on the other hand, there is displayed negligence towards family affairs, unreliability in business and in social relations, apathy towards higher interests; in general, forgetfulness of duties, inclination to lie, and so on, often in unmistakable manner. And, above all, strength of will and self-control are enfeebled. It is doubtless a question here of a relative or elective (sometimes only temporary) "dissolution" of higher ethical values, acquired slowly in a later period of life through education, and the discipline of daily duties, while the remaining traces of morality often assume infantile forms. The alcoholic, and even the sufferer from dementia praecox, doubtless in many directions of his emotional life regresses to a very early stage of childish development: the chief interests from this point on are related to the immediate present, to the immediate, personal (physical) comfort; that is, the instinct life strongly dominates. Care for the future is nearly extinguished, and the wishes take on an elementary character. The deterioration in cases of dementia praecox of this sort can go so far that only interests for the most vital bodily functions, and for (fragmentary) pictures from the remote past, are present. An attitude has been reached which coincides quite exactly with that of a small child, only that the drive towards perfection and broader development has been permanently lost.

Morality, especially the emotional life, in the psychoses, can sometimes be destroyed in manifold forms and with variations to any level. But this always takes place in the form of a "regression to a primitive grade of culture," or to levels which come to light in typical form in children and animals. And if it is a question of a degeneration of the individual, then it occurs under a continual decrease of the impulse towards higher goals, or perfection. The patient may remain, however, at any level of deteriorated morality (demoralization).

And what rôles do the nervous system and the inner secretions play here? Is it a question here only of biophysical, actual, and latent forms of excitement or of biochemical influences also? These both certainly enter into the question; the lion's share in the disintegration of the emotions, especially in the decrease of morality, must, however, be ascribed to the influence of the inner secretion, both active and latent, dependent upon the visceral and sympathetic nervous systems. In this connection, in relation to the latent emotional values one may recall the persisting energy of growth of the "fossil Egyptian grains of corn"! Every strong emotion and emotional value may correspond to a special chemical composition of the secretions of a special gland (though usually under similar conditions); the effect of this composition taking the character of a means of preserving an equilibrium in reference to other glands (antagonism between the adrenals, hypophysis, thyroid, and so on?). Probably the various inner secretions serving for the immediate preservation and for the continuance of the race, which are driven to the ganglia in question by the primitive mnemes, are those which flow most richly.

Many chemical materials work as direct ferments, and specifically on the visceral and cortical nervous apparatus in question. Thus possibly there might be "defensive ferments" for the emotional life, just as for foreign intruders in the blood. But all these are of course only hypotheses.

In chronic alcoholic poisoning and in dementia praecox it is possible that only the nerve cell complexes serving the inner secretions, possibly only the cortical representatives of these (anatomical basis for the affect), are inadequate to the many sided demands made on them, and perhaps only the chemical combinations for the emotions immediately entering into action are produced, and perhaps also certain chemical by-products are set free which cannot be rendered non-intoxicating or can only be partly rendered harmless (lipoids in the blood?).

In alcoholism it is a question usually of a poisoning which attacks a great number of organs and cellular groups. Everywhere the most complicated compositions are the easiest to decompose.

One can even speak of a decomposition of emotions and morality in healthy and well-dispositioned men. Here it is usually a question of briefly enduring, reactive conditions following release of violent emotion, of suggestive effects, or of life conditions and relations depressive to the mood, or bringing bitterness and despair. Less important forms of emotion win the upper hand easily. One must consider these forms as temporary "reactions" and there is usually a quick spontaneous return to normal through removal of the irritating moments as well as through moral counter-currents.

Indeed, the most simple release of a crude passion in an individual otherwise normal is regarded as an acute decomposition of morality under the influence of hypersecretion of the glands (adrenals?). It is inaugurated through a biological struggle over the interests most important at the moment for the individual's life, that is, for his immediate personal life or for the immediate future—interests which only too easily win the victim over the higher, humanitarian, altruistic interests, directed to the most remote future. The individual pays for momentary gratification of his crude instincts, if, for example, he permits an inconsiderate reaction in the interests of self-preservation (deed of violence) by another feeling of opposite nature, as the balance is restored; in the form of new emotions of different nature, that is, with remorse, feeling of guilt, which are suppressed into an existence in the latent state and the well-being of the carrier may be "poisoned" for a long time.

In these phenomena of dissolution, exhibited within certain limits by healthy people, phenomena whose foundation is to be sought usually in acute insults, menaces of various kinds (from those against the most primitive life interests to those against the most noble moral good), the object of the conflict is—as we have mentioned before—self-preservation, well-being and thriving condition of the family and members of the family or of home, and finally the ideal values of the world and the outlook for the future of all these. We have here the abandonment of the individual primitive instincts in favor of future interests, and especially in favor of the interests of society or humanity, or *vice versa*. These values are regarded as of greater or less importance, either consciously or unconsciously, according to the insight at a given moment, the emerging affects, or the education and culture. The balances or resultant consequences (advantageous or injurious for the individual) become the measure of the character of the personality. It is self-evident that subjective causality plays an extremely important rôle in these conflicts of the soul, which, for the most part, take place in the unconscious; also that the resolution into simpler elements (victory of inferior elements) may be progressive, and that the whole mentality of the individual may be thus unfavorably distorted (disintegration of the character). I will not here discuss the specific forms which this decomposition may take. There is no doubt that it may be produced through the influence of the inner secretions, as well as in other ways (that is, through the release of primitive instincts; by regression to earlier developmental stages of emotion and morality; or by an undue stability of elementary forms of emotion, with the subjective causality that goes with these conditions). It will be sufficient in this connection to merely call attention to the different forms of fear (despair), attacks of rage, the assumption of the attitude of self-defense without cause therefor, inclusive of the use of cunning, etc.; to the "retrospective transformation of the wish into realization" in the form of lies; to the joy in harming others; and further, to the wild outbreaks of normal and perverse sexuality and the rage to destroy—two tendencies at times occurring simultaneously—etc.

These phenomena, which are transient in nature, are not brought about by pathological processes, strictly so called, nor by degeneration of the nervous system, but are, as it were, physiological dissolutions, and are connected with the emotional sphere. They may affect whole peoples in stirring political periods, in struggles for religious values and the rights of man, in telluric catastrophies—varying slightly with the special tendencies, the degree of education and of suggestibility, of the individuals composing these peoples. In similar manner they make their appearance in the daily life of the individual, in the passionate struggle to protect vital interests when threatened, especially sexual interests. In all these cases, in my opinion, there must be assumed a poisoning or flooding of the blood with certain inner secretions (a release of the herd instinct, for example, taking place not infrequently through suggestion), with a transformation of the stimulation into a latency stage. The fact that under some conditions the highest ethical values are developed concurrently with these explosions of passion (as contrast formations) alters nothing in their nature, and they must be regarded as phenomena of acute moral decomposition, the ethical values being ephemeral compulsive explosions of "pseudoaltruistic" emotion which have little in common with real morality proceeding according to the laws of calm reason.

At all events, in these "emotional conflagrations" violent outbreaks of instinct occur only too often, and these invariably correspond to those developmental phases which belong to the earlier evolutional stages of morality.

CHAPTER VIII

FINAL OBSERVATIONS

(*The Struggle to Preserve Psychic Equilibrium and to Attain Emotional Contentment*)

If one looks beyond the subjective aspect, emotion is a physiologico-biological process (a tension seeking release), and, among other ways, manifests itself in the details of unconscious wishes, urges, and voluntary trends in the living protoplasm, or the collective cell hierarchies, or, in higher animals, in the central nervous system (cortex). There sets in a constant blind striving toward some goal useful for the individual in some direction or other. Ethical perfection, the subjective reflection of this tendency, in which the " beautiful moment " of Goethe plays an important rôle, is attained only by successive stages, and never to the satisfaction of the individual. Full security of position and life, complete peace and perfect contentment are only possible for brief moments—moments not rarely attained by great effort. The prospects for the future which we strive to endow with the same emotions of satisfaction are in reality only phantoms. Man strives untiringly but vainly to realize this dream, to which he gives the name of permanent happiness. But at each advance in these successive stages of " happiness in the immediate present " new difficulties arise. Only in conditions of intoxication (as after taking alcohol) are all the shadows removed from the prospect of the future—and then only temporarily. This condition of intoxication is the so-called illusion which may be produced in man by a transient favorable constellation of stimulations in the nervous system. We can easily understand the causes of the sense of inadequacy (disillusionment) if we cast a fleeting glance on the not always modest demands of the various organs and the latency stages constantly arising and extending farther therefrom, as well as on the numerous different goals striven for with equal degrees of longing: from the feeling of general bodily comfort, air to breath and food to eat, on to the highest ethical considerations, the enjoyment of art, etc.

A typical example of these conditions is that the ceaseless travail and effort of the cultured man to attain a permanent and entirely satisfactory position in life—to conquer a situation of contentment and the prospect of a peaceful future, is followed by a sudden disillusionment—often at the very moment when the long-dreamed-of plans have been brought to a happy realization. The love and honor of those belonging to him; the recognition of his merits and the high esteem of his fellow men, which he has earned by the services he has rendered; the assurance of material ease in the "future" for himself and for those dear to him, which at the end of his life he has attained and which also to a certain extent casts a pleasant reflection on his past—all these benefits lose their luster and their power to satisfy as soon as the endeavors and travail through which he has attained them come to a standstill. The honored statesman whose counsel is sought by an entire people, if he is not senile when he retires from active life, is in just as problematic a situation, as far as actual happiness is concerned, as the restless industrialist, or the peasant who, having been throughout his entire life engaged in successful enterprises, seeks, in advanced years, to pass the remaining years of his life in comfortable idleness. All these persons find only a very small part of the satisfaction they anticipated from a quiet life, and they usually arrive at the conclusion that the real pleasures of a passive and monotonous existence are incomparably less than those of a life of endeavor, even though the latter be filled with cares and anxieties. These are all facts which have long been known, and may be expressed as follows: The goal which we strive unceasingly to reach as the reward of our endeavors is illusory. It is not the final arrival at this goal which brings us true happiness—but the toil and striving toward that goal.

Enough! The joy of life, the peace of the soul, happiness, do not reside in us as an independent quality, as it might seem to us. It is only attained by the rational use of our powers, by the wise satisfaction of the instincts and emotions, by the observation of the requirements of morality. The benefits which are thus arrived at must, however, be conquered anew every day and every hour. In a last analysis they are based on a physiological and biological equilibrium of the nervous structures and of the proper inner secretions. The acute access of pleasure, so-called joy, is essentially fleeting in nature and is a relatively short phase in the development of the positive affect (for example, in the form of the honorable sexual life). "Joy" in its raptures and its transports carries within itself the seeds of death, *i.e.*, the germ of its negative or opposite complementary affect, and often vanishes even before its climax is reached. Only by repeatedly surmounting the external and internal obstacles, through the proper cultivation of the emotional life and the character, supported by the constantly active urge toward perfection, can an adult cultured person attain that which seems to be naturally granted to animals and children (who seem to live in the immediate present), namely, harmless pleasure in life. This involves biologically (as does inner contentment) the favorable sequel of a wonderfully organized struggle in the economy of our cell hierarchy, especially in the central nervous system, of a struggle for the preservation of the equilibrium of the soul, in which the following factors, the value of which we have already sufficiently emphasized, are included: bodily well-being, sexual interests, the most restricted and the wider social interests, and the personal relations to God and humanity.

In this ceaseless struggle, embracing so many factors, into the details of which consciousness can never penetrate, the separate cells of the various sorts of tissue take part in obedience to the mnemes, seeking to preserve their individual and collective existence. The real protective agent of our bodily well-being and our highest moral interests, *i.e.*, the central nervous system (especially the cortex), is the most important element in this struggle (though it is not the sole important one). Here are made the decisions as to what is best for each organ, for each phase of life, for each moral value, and above all what is most expedient generally, that is to say, when and how the interest of the immediate present should be sacrificed to future and higher interests.

In healthy and well brought up persons, in the sphere of the central nervous system, just as in the motor sphere, the inhibitive apparatus with reciprocal relation to the powerful stimulative apparatus is well developed and organized. These two apparatuses are always in condition to influence and complement each other, provided the equilibrium in one direction or the other has not been disturbed by poisons, pathological processes, disastrous emotional experiences, catastrophes, etc. It is also indisputable that what we call the purpose of life and morality is the result of a conflict between emotional factors acting in contrary directions (the worst vices and the highest virtues are found side by side " in our breasts "). The physiological basis of these elements is to be sought, not only in the collective activities of the structures of the nervous system, or in the cortex, *i.e.*, in the so-called " world of ideas," but also in the inner secretions which work in, and with, these structures, that is, they are to be sought also in the biochemical factors of the unconscious volition and the mysterious primitive mnemes.

And Goethe, when he touches on this problem from a poetical or philosophical point of view, certainly hits the nail on the head when, in the second part of *Faust*, he makes the dying Faust say:

> Yea, to this thought I cling, with virtue rife,
>   Wisdom's last fruit, profoundly true:
> Freedom alone he earns as well as life,
>   Who day by day must conquer them anew,
> So girt by danger, childhood bravely here,
> Youth, manhood, age, shall dwell from year to year.
>
> —(From Swanwick's translation of *Faust*.)

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